# DEVELOPED LESSONS IN PSYCHOLOGY

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# DEVELOPED LESSONS IN PSYCHOLOGY

INCLUDING

## OBJECTIVE TESTS WITH NORMS

BY

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# PREFACE

*Developed Lessons in Psychology* is the result of an attempt to apply some of psychology's own principles towards improving instruction in the first course in general psychology. It has been experimentally tried for three years; it is now tentatively presented for the use of teachers and students who are interested in changing college instruction to the extent of invalidating Professor James Harvey Robinson's well-known description of a college as "a place where there is much teaching but no learning." Its present content and organization are the result of comprehensive investigations [1] of the interrelation of teaching and learning in the first course in psychology and the application of such findings in the reconstruction of the course. *Developed Lessons* is a guide to an intelligent use of many texts as source materials for active learning.

The indebtedness of the authors is too great and too general to be acknowledged properly. Obviously, their first indebtedness is to the original sources of their interest and stimulation in the subject matter of psychology: Professors E. L. Thorndike, R. S. Woodworth, A. I. Gates, R. Pintner, and A. A. Cleveland. Of nearly equal significance is their indebtedness for their source of interest in the improvement of college instruction to Professors W. H. Kilpatrick, H. O. Rugg, and W. C. Bagley. We wish to acknowledge the coöperation and helpfulness of Miss Rachel Morris as one who used the *Developed Lessons* in her classes in psychology at Lindenwood College, Saint Charles, Missouri. To the authors and publishers of the books and articles to which reference is made we also make

[1] The first of these studies, "Extent and Nature of Psychology Students Know Before and After the First Course," will appear in an early issue of the *Journal of Genetic Psychology*. Other articles on the nature, content, and organization; the nature of learners who succeed and those who fail; and motivation of learning by the use of objective tests are in preparation.

acknowledgments. And we do not forget the inspiration of the colleagues of the writers at Dartmouth, at Oregon State College, at Washington University, and the Psychiatric Clinic in St. Louis, Mo. We also greatly appreciate the hearty coöperation of the more than 1500 students whose experiences with these *Developed Lessons* are their real basis and source of motivation.

H. M.
E. M. B.

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# DEVELOPED LESSONS IN PSYCHOLOGY

# INTRODUCTION

## I. The Relation Between Lecturing and Learning and the Possibilities of Improving the First Course in Psychology

The content of a college teacher's lecture of one hour and what a student who listens to him learns in the hour are never equal either quantitatively or qualitatively. And what a student learns from the effortful study of a chapter in a textbook does not always conform to what the text really says. Frequently such inadequate results are due, at least in part, to an effort to memorize in more or less rote fashion. To be sure rote memory often is an important form of learning, but there is a world of difference between learning from books and mere memorizing and reciting passages or outlines from books or at worst, *a* book. Objects of knowledge and stimuli to knowing are not the same. It is in the recognition of such facts and in the resulting attempts to apply psychology to education that much has been revealed concerning such problems as (a) the motivation of learning; (b) the values of discussion and of discussion groups in learning and teaching to think; (c) the need for the perception of relations as well as the memorization of parts, i.e., the need for integration of knowledge; (d) the significance of knowing about the process used in discovering facts as well as the knowing of the facts; and in developing what Dewey would call creative intelligence (e) the importance of knowing *how* man knows as well as *what* he knows. In the field of college teaching in general, including the teaching of psychology in which we are particularly concerned, these contributions have been but little applied. Even the possible values of academic psychology are not well recognized. According to the press, for example, seniors in a large Eastern university have voted in successive years that psychology has been the least interesting and the least valuable subject in their curriculum. This is probably the exceptional and extreme

case, but it may be used to illustrate the probable fact that first courses in psychology are not considered by students as invaluable as their teachers know they should be. Are not the reasons for this condition to be found in the nature of the course, including the materials of instruction and their organization, as now presented, and in the methods of study and instruction used? Isn't this why, as one student from another institution put it, "The whole course is nothing more than muddling through an unintelligible textbook." The purpose of *Developed Lessons* is to help instructors and students to apply some of the aforementioned contributions of educational psychology and so to make the first course less of a "muddle" and more of an intelligible, humanized, constructive, personal experience for each learner.

The general attitude of the writers toward the give and take between psychologists who, like Dr. Max Meyer, favor in the first course emphasis upon basic facts and those who favor a more practical content and organization is pragmatic. The nature of it is indicated in the following assumptions:

1. In the first course in psychology as in any science a student is definitely restricted and limited in achievement.

2. The first emphasis must be laid upon fundamental facts, concepts, and methods — not upon preconceived notions of what is basic.

3. These basic concepts, once selected because they were considered of most worth by leaders in the field, should now be organized to guarantee what leaders in curriculum construction are calling "a maximum of life-likeness to the learner."

In the matter of content this means that, besides the basic concepts, the students should have a glimpse of the broader problems which are studied in advanced courses; of the narrower fields for special study; of the practical values of psychological facts and procedure for educational, social, and vocational life; and of the limitations of these facts and procedures. In the matter of teaching technique, or more accurately learning procedure, it means the emotionalizing of scientific findings instead of the intellectualizing of our feelings and emotions. To assist in introducing the student to such a

viewpoint the *Developed Lessons* are offered. They have been designed for use primarily in colleges in which the introductory course in general psychology is offered to sophomores and juniors.

The method for the general use of the book is obvious. It is to be placed in the hands of each student as a guide to study. In each section of the book a general problem is presented and general references are cited. Specific problems and specific references develop some aspects of the problems. Study guidance is offered in an introductory statement of the general problem, followed by selected references and direct questions. Through the sequence of these the theme of the lesson is developed. The questions are offered to challenge and to make specific the problems which should be met, and if answered well they should crystallize facts into significant meaning. In their preparation the authors have tried to select questions which are properly within the range of students' abilities and of relatively great worth. It is hoped that they will tend to force knowledge to be articulate instead of vague and marginal. Their use may help the teacher also as an objective guide to determine whether his own questions have been assuming too little or too much.

Following the questions there is a section for review. Ordinarily this consists of a list of concepts which have been encountered in the preparation of the lesson. Succinct definitions and utilization of concepts seem, objectively at least, to be near to the heart of instruction. Drill in these concepts should prove valuable. And finally, to give the student a chance to test, in a rough way, the thoroughness of his own preparation, objective tests on the material of the respective sections are given for self-testing. Answers with tentative norms for the interpretation of the scores earned appear in the Appendix. The degree to which motivation can be stimulated by such techniques may surprise those who have not used them. Two possibilities of appeal are emphasized. One of these is self-emulation. The student is urged to keep a graphed chart of his standing in each of the tests, and is urged in succeeding tests to surpass his own previous record. Secondly, it is suggested that the teacher arrange for a committee of the class to de-

termine the median class scores and to compare these with the norms which represent what other classes have done on the same tests. Class interest and enthusiasm may be helpful to all members of the group. An explanation of the norms and the method of scoring the tests will be found at the end of Topic II, p. 24.

The second suggestion for vitalizing psychology is that of enriching the content. A cursory survey of the book will disclose the wide offering of suggested readings. The practicality of this is presented in another section (p. 194). Materials have been chosen with the view of directing the student to some of the best (for him) and standard presentations of the respective topics. Excess foliage and controversial articles have been avoided, except in a few instances; effort has been made, however, to select references which represent different points of view. In no respect are the references exhaustive. Critical consideration of different viewpoints should lead to clearer insight and better understanding than can be achieved from a single one.

The plan offers elasticity and flexibility of method and of content. Assignment can range from minimum essentials for some courses, classes, sections, or students to extended reading which can be done only by superior students and those in honors courses.

## II. Summary of the Special Features of "Developed Lessons"

1. Organization of materials of instruction into a small number of related sections and lessons rather than the usual twenty or more loosely knitted chapters.

2. Inclusion, in preliminary remarks which precede each topic as well as each section, of brief but clear descriptions of how the materials to be studied are related to the materials which already have been studied and with the integral whole.

3. Inclusion of objective tests of various types — some new — for the purpose of measuring the intelligent use of knowledge and not mere rote memory.

4. Inclusion of tentative norms so that the tests can be used directly for the motivation of learning.

5. Selection of and emphasis on materials which are to be preferred as connected with life situations of students.

6. Inclusion of references adaptable for either more or less intensive study of special topics.

7. Inclusion of a list of concepts which the student should know and which may be used as a basis for a topical "check-up" at the end of each learning work-unit.

8. Emphasis upon the continuity and relations of the lessons and topics studied.

9. Challenging nature of the questions which cover the content of the course.

10. Adaptability of the content and method. The materials can be used for either brief or extended courses and are adaptable to various modifications of the plan outlined here.

## III. How to Use "Developed Lessons" Effectively

### *Suggestions to Students*

"Anyone who can learn from life can learn from books. But there is a difference between learning from books and merely learning to repeat passages from them." The *Developed Lessons* are planned to help you to learn rather than to repeat statements of facts. The following suggestions for effective use are based upon actual experience of students with these lessons. There is no one method which is best for all learners. The habits and nature of the learner should be determining factors in the selection of the methods to be used. The suggestions herein given should, therefore, not be considered as arbitrary rules which must be followed if successful learning is desired. They are suggestions for use which have been found by other learners to be effective.

1. Read the table of contents and attempt to obtain a clear, general idea of the subject matter as a whole.

2. Read the preliminary statement before each section and conceptually relate the content as presented with the ma-

terials of the previous section. Do the same for each topic and sub-topic.

3. Read at least one of the general references covering the whole lesson (rather rapidly).

4. Read the questions under the first topic in the section to obtain a general idea of the content.

5. Read the general reference carefully and, if necessary, take notes — with the end in view at this time of answering all the questions which are included in the topic. Continue similarly for the sub-topics, reading as many special references as you deem necessary.

6. Talk over the subject matter of the *Lessons* with members of your discussion group if this method of teaching is used; if not, with your classmates. Consider the implications.

7. Think it over — let the materials incubate. Do not immediately dismiss the materials from your mind.

8. Test yourself on the list of concepts at the end of each learning work-unit. Review the subject matter related to the concepts of which you are uncertain.

9. Take the test at the end of the lesson without looking at the answers or norms.

10. Score the test and compare your score with the norms given.

11. Diagnose your failures and follow it with a review of the subject matter covering the materials which are not well enough known. In case you disagree with the answer as found in the Appendix, verify the facts, and remember that the learning is the important factor after all. Some elements of the tests may be found to be ambiguous.

12. Glance at the captions of each topic and think over the details of the topic. Then look over the questions to check up on your full grasp of the concepts which have been covered. Consolidate your facts and concepts and see whether you can perceive the topic as an integral whole.

# SECTION I: SCOPE AND METHODS OF PSYCHOLOGY

*Introductory Remarks:* Psychology is today making great changes in the world's thinking — changes in the world's thinking about our most vital problems. The influence of the psychological point of view can be seen in the theater, in literature, in education, in industry, in the social sciences, and in practically every aspect of life and in every field of knowledge. Until a few years ago psychology had very little influence. Why the difference? Partly because psychology itself has changed. It has changed its scope, changed its methodology, changed its point of view. The psychology of yesterday dealt with problems whose solution meant little, if anything, to the medical man, the parent, the teacher, or the man in industry. The psychology of today is interested in the dynamics of human nature and behavior; the causes and effects of mental activities. It, therefore, has significance for all. This development of the science of psychology into its present state is one of the problems which will be covered in Section I, the aim of which is two-fold:

1. To give the beginning student an idea of the kind of subject matter which psychology studies and of some of the problems it attempts to solve. This will be treated in Topic I under the caption, "What Psychology Is and What It Studies."

2. To give the student a general idea of psychological procedure. This will include not only a study of the various methods used by psychologists in solving their particular problems but also a consideration of the characteristics of scientific procedure in general. All this is designed to throw light on the nature and significance of psychologizing about problems of human behavior — social, as well as individual, behavior. This will be treated in Topic II under the caption, "How Psychology Studies Consciousness and Behavior."

## Topic I: What Psychology Is and What It Studies

Psychology has something to do with the study of mind. Many beginning students say this; but very few know what the "study of mind" means and involves. Just what is psychological subject matter? Does psychology have anything to do with astrology? Physiognomy? Phrenology? Other commercial systems of character analysis? How is psychology related to other fields of knowledge? to the natural sciences? the biological sciences? the social sciences? What are the important aspects of the science of psychology and with what kind of problems does each deal? These are, in the large, the questions which will be considered in Topic I of this section.

[1] *General References for Topic I:*

[2] Woodworth — *Psychology,* Chap. I (Chap. I)
[2] Gates — *Elementary Psychology,* Chap. I (Chap. I)
Robinson and Robinson — *Readings in General Psychology,* Chap. I

*For further study:*

Dashiell — *Fundamentals of Objective Psychology,* Chap. I
Schoen - Human Nature Chap. I

### I. WHAT PSYCHOLOGY STUDIES

*References:*

* Burtt — *Employment Psychology,* Chap. I [3] –
Martin — *Psychology,* Lecture I

The early philosophers talked of a "mind" which consisted of a "knower" who existed outside of and independent of his

[1] For the full titles consult the bibliography, pp. 194–201.

[2] The repeated references refer to the two editions, cf. p. 195. In most instances references are given to both editions; in this case the desired chapters have the same numbers. The first reference given refers to the revised edition; references to the earlier editions usually follow those to the revised edition and are enclosed within parentheses.

[3] Special references marked * are cited because they may be needed for answers to some questions. Others are included because of their special value for general interpretation, for a particular point of view, or for desirable

ideas. Does modern psychology accept this view? Is mind a mystical entity? Does modern psychology assume a spiritual being hidden within the organism? Does the evidence warrant such an assumption?

What is the meaning and significance of the following statement taken from Robinson's *Mind in the Making*, p. 34: "No mind exempt from bodily processes, animal impulses, savage traditions, infantile impressions, conventional reactions, and traditional knowledge ever existed."

Does mind have to do exclusively with conscious thought? Is it an entity within man which perceives, remembers, judges, reasons, wills, and feels? Are we aware of everything we perceive, remember, will? What findings show this? Is mind invisible? Is it a product of the body? Is it a process? Does psychology treat mind as it does other forms of reality? What does psychology study when it studies the mind? What is a psychological fact? Roughly speaking, is it correct to say, "mind is how the body behaves"? What does psychology include in mental life? To what extent does a psychologist properly study physiology? Does psychology study: (a) the processes of circulation and digestion: (b) the functions and defects of vision; (c) the functions of the nervous system? Does it study animal magnetism? Why, or why not? How does psychology look upon the following systems for measuring character: phrenology? astrology? physiognomy? endocrinology? crystal gazing? clairvoyance? graphology? Evaluate the usefulness of each in respect to its validity, objectivity, and reliability.

Answer the following questions concerning each of the given definitions:

(a) Is it or is it not in accord with modern psychological tendencies?
(b) How? Why or why not?
(c) Does it indicate behavioristic or introspective emphasis?

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additional extensiveness or breadth of treatment. The general references are not so designated, for they are of more nearly equal value. Any one should be studied rather thoroughly, and others examined as individual need may determine.

1. Psychology is the science of the mind.
2. Psychology is the science of the soul.
3. Psychology is the science of consciousness.
4. Psychology is the study of conscious behavior.
5. Psychology is the study of behavior.
6. Psychology is the study of mental life.
7. Psychology is the study of human nature.
8. Why we feel, think, wish, and behave as we do is the subject matter of psychology.
9. Psychology is the science of conscious and near-conscious activities of living individuals. (Woodworth)
10. Psychology is that division of natural science which takes human activity and conduct for its subject matter. (Watson)
11. Psychology is the science which deals with the facts and events arising out of the inter-action between a creature and its environment by means of receptors, nervous system, and effectors. (Warren)
12. Psychology is the science of consciousness and behavior.
13. Psychology is the science of conscious states as such. (Ladd)

## II. RELATION OF PSYCHOLOGY TO OTHER FIELDS OF KNOWLEDGE

*References:*

ROBINSON AND ROBINSON — *Readings in Psychology,* pp. 23–25

* WARREN — *Human Psychology,* Chap. I

Before any study may be properly called a science there must be some agreement as to its scope. Generally speaking, what is the scope of psychology? With what other sciences is it now commonly grouped? Why? What are the three levels into which the biological sciences can be divided? What is the scope of each? What is the dividing line or cleft between psychology and physiology? Do physiologists ever work on the psychological level? Do psychologists ever 'physiologize'? In the study of what kind of problems would physiology and psychology especially overlap?

What is the relation between astronomy and psychology? Between geology and psychology? Between physics or chemistry and psychology? In what sense are logic and mathematics general and abstract sciences? What is the relation of

psychology to the social sciences? Where do psychology and sociology overlap? What was the relation between ancient psychology and philosophy? The philosophies of James and Dewey are related to psychology in what way?

The following statement is the response of Thorndike to the psychologists who complained that if psychology is the science of behavior it would be swallowed up by biology: (*Animal Intelligence,* p. 5) " When a body of facts treated subjectively, vaguely and without quantitative precision by one science or group of scientists comes to be treated more objectively, definitely and exactly by another, it is of course a gain, a symptom of general advance of science. That geology may become a part of physics, or physiology a part of chemistry, is testimony of the advance of geology and physiology. Light is no less worthy of study by being found to be explainable by laws discovered in the study of electricity. Meteorology had to reach a relatively high degree of development to provoke the wit to say that ' all the science in meteorology is physics, the rest is wind.' " Does this attitude imply compartmentalizing of knowledge? What is the connection between this statement and the statement of Loeb to the effect that " all knowledge is one " ? Is this a healthful attitude for the scientific worker? Why? Illustrate with the work of some experimenters who took such an attitude.

### III. THE FIELD OF PSYCHOLOGY

*References:*

* Strong — *Introductory Psychology for Teachers,* Chap. I
Warren — *Human Psychology,* Chap. I

Some excellent illustrations of the kind of materials studied in many divisions of psychology are contained in Chapter I of Strong's *Introductory Psychology for Teachers.* Classify each under the following captions by writing under Column I the numbers of each of the examples after the appropriate divisions of psychology. Include also the five sub-sections under 4 (pp. 4 and 5).

| *Division of Psychology* | *I. Illustrations in Strong* | *II. Prominent writer or worker in each field* | *III. Book in each field* |
|---|---|---|---|
| General Psychology | | | |
| Comparative Psychology | | | |
| Abnormal Psychology | | | |
| Genetic Psychology | | | |
| Social Psychology | | | |
| Applied Psychology [4] | | | |
| Physiological Psychology | | | |
| Educational Psychology | | | |

Under Column II write the name of at least one worker or writer in each of the special fields of psychology named. Under Column III write the name of at least one book in each field.

Classify each of the following problems largely selected at random from recent psychological journals under one or more of the foregoing divisions of psychology:

1. The Nature of Intelligence
2. The Curve of Forgetting in Advertising
3. A Child Who Would Not Talk
4. When is a Man Intoxicated?
5. Rests, Authorized and Unauthorized
6. Interpreting a Compulsion Neurosis
7. The Study of Feeblemindedness
8. Evaluation of Certain Incentives in School Work
9. Maladjustments Among College Students
10. How Many Selves Have We?
11. Innate Factors in Radicalism and Conservatism
12. The Intelligence of Apes
13. A Test for Social Perception
14. Do Kittens Instinctively Kill Mice?
15. Overcoming of Distraction and Other Resistances
16. Recitation as a Factor in Memorizing
17. The Psychology of the Organized Group Game
18. Cerebral — Mental Relations
19. Maturation and Use in the Development of an Instinct
20. Bodily Changes in Pain, Hunger, Fear, Rage

[4] By applied psychology is meant that group of applied psychologies which are not otherwise included here, such as industrial psychology, business psychology, psychology of law, psychology of medicine, and the like.

21. Motion Study for the Handicapped
22. Effects of Loss of Sleep
23. On the Psychomotor Mechanisms of Typewriting
24. Validity of Character Judgment Based on External Criteria
25. Measurements of Interests

## Topic II: How Psychology Studies Behavior and Consciousness

It is not the materials but the method used in the study of the materials that determines what is or is not science. Human nature and behavior merely talked about are not science. But the same subject matter treated in accordance with the principles of scientific procedure is science. The aim of this lesson is to show how modern psychology conducts its work as contrasted to other treatments of the same subject matter. This involves: (1) the study of scientific procedure in general; (2) the study of the process of rationalizing about human nature; (3) the study of the more important points of view in psychology; and (4) a study of the methods used in psychology and an evaluation of these in the light of the principles of scientific procedure.

### I. CHARACTERISTICS OF SCIENTIFIC PROCEDURE

*References:*

* Gates — *Elementary Psychology*, pp. 2–16 (2–16)
* Robinson and Robinson — *Readings in Psychology*, pp. 2–5; 417–423
Warren — *Elements of Human Psychology*, p. 7
Dashiell — *Fundamentals of Objective Psychology*, pp. 8–18

Are our everyday observations very reliable? What evidence do you have for your answer? Does science depend on observation? What are some essential differences between the observations of the scientist at his work and our everyday observations? What are some of the causes for our errors in observing? What are some of the means used by the scientist to eliminate errors and increase the reliability of his observations? How does he control variables experimentally? Statistically?

What is an hypothesis? Illustrate its use in any field of knowledge. How is it tested and verified? Are natural laws active forces which rule the universe? Do scientific laws govern activities? What, then, is a scientific law? What does Dewey mean by saying that generalizations are not fixed rules but are instrumentalities for investigation to be tested and revised by their future working? What is the Law of Parsimony? Illustrate its use in science. In what sciences — biological, social, or natural — are we more likely to abide by it? Why? If there is more than one hypothesis which explains a certain state of affairs, what will be the characteristics of the one that science will favor? How does science look upon causeless phenomena? In psychology what determines what is and what is not science? Comment on Pearson's statement: "The scientific method is the sole gateway to the whole region of knowledge." What is meant by the perpetual tentativeness of science? What are the steps of reasoning as given by Dewey? Illustrate the use of these steps by some experimenter in any field of work — preferably some well-known scientific work.

### II. RATIONALIZING ABOUT HUMAN NATURE

*References:*

* Robinson — *Mind in the Making*, pp. 40–48
* Gates — *Elementary Psychology*, pp. 252–262 (259–264)

Man calls himself a rational animal. But he does things which are not readily classifiable as rational. To excuse himself what does he do? What is the process called? What distinguishes it from genuine reasoning? Which is the more subjective and personal? Which is more blind to evidence? In our everyday life are we always conscious of our rationalizing? Are our rationalized motives real? Discuss briefly the rôle of rationalization in mental adjustment.

#### EXERCISE

1. Briefly indicate on the following lines, or on a separate sheet of paper, five outstanding illustrations of rationalization which have come to your attention recently. (If you have not noticed any, make your list after twenty-four hours during which

time watch for instances among your fellow students and acquaintances.)

a.....
b.....
c.....
d.....
e.....

2. Give an illustration of each of the following types of rationalization:

Projection
Sour grapes mechanism
Converse of Sour Grapes
Logic Tight Compartments

What kind of conception of human nature would you expect the philosopher with an optimistic outlook on life to have? Would he picture man as a rational animal or as a cruel, beastly, selfish animal? How would the rationalizing pessimist picture human nature? Illustrate. What conception of human nature would you expect from one who favored naïve democracy? One who favored Marxian Socialism? From the emotional radical? From the reactionary? Are these conceptions of human nature based on facts? On verified observations? Are they free of the idiosyncrasy of the individual? Or are they logical assumptions not related to the realities of life? Is this procedure in accord with the characteristics of scientific procedure? How reliable is this procedure? What field of knowledge is in special danger of being rationalized about? What is the present tendency in this field of knowledge? Justify or criticize the following statement from Robinson's *Mind in the Making:* "The fact that an idea is ancient and that it has been widely received is no argument in its favor but should immediately suggest the necessity of carefully testing it as a probable instance of rationalization."

### III. PSYCHOLOGISTS' APPROACH TO THE STUDY OF HUMAN NATURE

*References:*

* ROBINSON AND ROBINSON — *Readings in Psychology,* pp. 10–13

WATSON — *Behaviorism,* Chaps. I and II
ALLPORT — *Social Psychology,* p. 1
* GATES — *Elementary Psychology,* pp. 32–38 and 51–53 (32–38 and 51–53)
* WOODWORTH — *Psychology,* Chap. IV (Chap. II)

*For further study:*

DASHIELL — *Fundamentals of Objective Psychology,* Chap. III

### *The Psychological Approach*

How does the psychologist view human conduct? Misconduct? Parents praise, blame, scold, or exhort their children. Judges pass judgment on human actions. What does the psychologist do? What is the essential difference between the work of the lawyer and that of the psychologist in their methods of attack? How does the psychologist view right and wrong? Is the psychological attitude: Tolerant or intolerant? Matter of fact or sentimental? Rational or emotional? Prejudiced or disinterested? Personal or impersonal? Humane or inhuman?

Is it sound psychological procedure to argue on general principles developed by the armchair method? Never? Sometimes? When? Is it reliable psychological procedure to "read in" motives and to give these as explanations of behavior? In the study of group activities would it be sound to explain in terms of instincts? Never? Always? When? Would it be sound to explain individual behavior in terms of hereditary trends? When and when not?

### *The Working Hypothesis in Psychology*

In common with the other sciences psychology has taken an evolutionist's view of life — in this case an evolutionist's view of mental life. The mental life of man is complex. To analyze it is not easy. We tend to rationalize about it. To guard against this tendency psychologists have formulated a working hypothesis, the purpose of which is to keep us close to the ground. What is the hypothesis called? Give a brief statement of it? What are the components of behavior according to this hypothesis? Is it applicable to muscular ac-

tivities? Glandular activities? Mental activities? Conscious responses? What is meant by the stimulus? The response? Is a stimulus necessarily the cause of an activity? Explain the following statement from Thorndike from the standpoint of prediction and control of human behavior: "Any fact of intellect, character, skill means a tendency to respond in a certain way to a certain situation." Is this hypothesis in accord with the Law of Parsimony? Illustrate and explain.

### IV. METHODS IN PSYCHOLOGY

*References:*

* Robinson and Robinson — *Readings in General Psychology,* pp. 10–13
* Watson — *Psychology from the Standpoint of a Behaviorist,* Chap. II
Warren — *Elements of Human Psychology,* pp. 8–12

Some methods used in psychology may be listed as follows:

1. Self-observation
   a. Verbal report
   b. More complex introspection
2. Observation with instrumental control
3. Observation without instrumental control
4. Testing and measurement
5. Psychoanalysis

Describe or explain each. Illustrate wherever possible.

Before each of the following write the number corresponding to each of the foregoing to show which is the best method for its study:

a. Consciousness
b. Animal behavior
c. Visual after-images
d. Feelings
e. Sensations
f. Child behavior
g. Personality problems

Which method is not accepted by Behaviorists? Is introspection a promising method for the animal psychologist? Is

testing as a method acceptable to Introspectionists? To Behaviorists? How do psychologists view the findings of psychoanalysis? What are the general theories of psychoanalysis? What are the advantages of the objective method? What are some of its limitations in psychology? What are the limitations of introspection as an only method?

What are the special features and limitations of the following approaches or methods:

(a) The case history method?
(b) The experimental method?
(c) The genetic method?

Which is especially adapted for clinical studies of personality? Which is most used in psychological laboratories? What is the relation of the case history method to the genetic method? What psychologists advocate that we accumulate psychological facts by any method that will give the facts?

### V. LIST OF CONCEPTS IN TOPICS I AND II

Test yourself on your ability to state clearly and concisely, or to explain to your discussion group or class the precise meaning of the following concepts:

Conscious activities; Behaviorism; Introspection; Objective method; Subjective method; Biological concept of mind; Relation of psychology to other sciences; Kinds of problems psychology studies; Scientific method; Rationalization; Types of rationalization; Psychological attitude; Law of Parsimony; The reaction hypothesis; Components of behavior; Psychological methods; Experimental method; Case history method; and Genetic method.

## How to Use the Tests

You have now studied and reviewed the first section of your course; it is time to try yourself to see how effective your study has been. Test I is now presented in two parts, the first of which is in the form of true and false sentences and the second is a matching test. How well you do in these tests will

give you some knowledge of how well you have mastered the section in comparison with what others have done.

Read the directions for each part of the examination carefully and follow them explicitly. Do not obtain help from any source; test yourself to see how well you can mark them without help. After you have completed them, read the suggestions about how to interpret your score. If you have studied these questions and answers previously, it would not be fair to compare your score with those who had not done so.

It is not essential that you mark in your book, for other paper can be used just as well. Particularly, if you should wish to use these tests for subsequent review it would be helpful to you if your first answers were not before you. Hold a sheet of paper at the side of the test elements, but so that they will be visible, and mark the answer to each element directly opposite it. Such answers can be scored easily. But, if you prefer, make the marks in your book.

When you are ready to try the test, read the directions carefully, do as directed, and work steadily and carefully without either rushing or dawdling. After you have finished, read the suggestions, ' How to Interpret Your Score," page 24.

## Test I: Scope and Methods of Psychology

### Part I

Directions. Write a plus sign (+) before each statement you consider true and a minus sign (−) before each statement you consider false.

1. Science knows no causeless phenomena.
2. A scientific hypothesis should be subject to verification by a competent observer.
3. The basic problem of psychology is that of the immortality of the soul.
4. Psychology is a biological science.
5. A scientific law governs described activities.
6. Psychology is the foundation of the social sciences.
7. Early scientific psychologists interested themselves primarily in the objective aspects of behavior.
8. Rationalization is the process of self-excusing.
9. Scientific psychology attempts to apply the methods of the natural sciences to the study of human nature.
10. Behaviorists advocate the use of introspection as the method for psychology.
11. Profound thinkers never rationalize.
12. " Reading in " motives is sound psychological procedure.
13. The tendency in psychology today is behavioristic and dynamic.
14. The science of education is largely an application of psychology.
15. The pessimist is likely to consider man a rational animal.
16. The optimist is likely to consider man a beastly creature.
17. Human nature is always the same.
18. Each scientific discovery increases the number of problems.
19. Why we feel, think, act as we do is subject matter for psychology.
20. Psychology takes an evolutionary view of mental life.
21. We are aware of everything we perceive, remember, will.
22. The position of the planets at the time of one's birth is a reliable index of character.
23. Our everyday observations have been shown to be very reliable.
24. A scientific law is a summary of observed relations.
25. Physiologists sometimes work on the psychological level.

26. Heavy eyebrows are marked characteristics of amorous and jealous natures.
27. Slightly bulging eyes indicate uncanny memories.
28. All generally accepted ideas are reasonable.
29. Any person can introspect reliably.
30. There is no reliability found in any of the introspective experiments.
31. The normal blond has positive, dynamic characteristics.
32. The psychologist sometimes works on the physiological level.
33. Psychology studies the influence of emotions and emotionalizing stimuli.
34. There is no idea or act that is not directly or indirectly a part of the process of adjustment of living organisms to environment.
35. Mind is a product of the body.
36. The essential characteristic of the case study method is its use of statistical procedure.

## Part II

DIRECTIONS. Before each item in Column B place the number of that item in Column A with which it is most closely related. Place no more than one number before each item in Column B. Mark " o " before the items in Column B for which there are no associated answers in Column A.

*First Half*

| (*Column A*) | (*Column B*) |
|---|---|
| 1. Method of character analysis not accepted by science | ..... Rests, authorized and unauthorized |
| 2. Method of character analysis partly accepted by science | ..... Testing |
| 3. A problem in applied psychology | ..... Physiognomy |
| 4. A problem in social psychology | ..... Overcoming of distractions |
| 5. Characteristic of an hypothesis which science would favor | ..... Reflexes |
| 6. Example of objective fact or facts which can be studied objectively | ..... Determination of the influence of anger on mental activity |
| 7. Example of a subjective fact or facts which can be studied by introspection | ..... Graphology |
| 8. A method which is used in psychology | ..... Instincts |
| 9. A characteristic of scientific procedure | ..... Innate factors in radicalism and conservatism |
| 10. A characteristic of popular thinking | ..... Astrology |
| | ..... The explanation which has the most universal application |
| | ..... Religion and its influences |
| | ..... Endocrinology |
| | ..... Swayed by emotions |
| | ..... Customs |
| | ..... Sensation |
| | ..... Phrenology |
| | ..... Conditioned by fear |
| | ..... Habits |
| | ..... Anger |
| | ..... Feeling, pleasant or unpleasant |
| | ..... Capacities |

(*Column A*) (*Column B*)

- ...N...The simplest explanation
- ...4...Observation with instrumental control
- .....Accuracy
- ...10...Subjective
- .....Introspection
- ...9...Objective
- .....Rationalized
- ...8...Impersonal attitude
- 2 0 X...Psychoanalysis
- ...12...Biased by hopes
- ...7...Precision

*Second Half*

1. A book which contains a good treatment of the Reaction Hypothesis
2. A book which contains a good treatment of the characteristics of scientific procedure
3. Contains a good treatment of rationalization
4. Contains illustrations from various divisions of psychology
5. A leading exponent of Behaviorism
6. A leading exponent of introspection
7. Adapted for clinical studies of personality

- ...6...Titchener
- .....Warren's *Human Psychology*
- .....Gates' *Elementary Psychology*
- ...N...Watson
- ...7...Strong's *Introductory Psychology for Teachers*
- .....Robinson's *Mind in the Making*
- ...1...Woodworth's *Psychology*
- ...1...Case history method

## How to Interpret Your Score

The correct [5] markings for these questions are given on pp. 169 ff. For the true-false test compare your own markings with the plus's and minus's as indicated in the column marked "Part I," and mark with an "X" each wrong answer. If you have omitted any answer mark it "omitted." Notice on the page that it says, "Score — Number right minus the number wrong." So count up the number of elements in Part I which you have marked correctly; similarly count the number that you have marked incorrectly. Do not include in either group those which you have omitted and have not marked. Your score for this part of the test will be found when you subtract the number you have marked incorrectly from the number you have marked correctly.

Similarly correct your work on the matching test by comparing your marking of the answers with those given for "Part II." In this part your score is the number you have marked correctly. Your score for Test I is the sum of your scores for each of the two parts.

Norms [6] are given to help you tell how high or how low your score is, for these tell you how well others have done. Notice the norms for this test. Of a group of 231 students on this test of 86 elements, the lowest score (cf. range 24–73) was 24 and the highest score was 73. The score of 49 (cf. median — 49)

[5] Ambiguous elements almost certainly will be found; and also there may be errors in the keys. While these should be reduced to a minimum, it should be remembered that the most essential factor is that of the learning involved. Discussion of uncertain elements is recommended as a splendid method of learning to make proper distinctions or to emphasize relationships which otherwise might be overlooked. Ambiguities often exist because of insufficient technical qualification within the test elements. Excessive qualification of statements has been avoided for simplicity and because it has seemed unnecessary for students in a first course. Bickerings about meanings should be avoided, but clear thinking should be encouraged. The authors will appreciate reports of ambiguous elements.

[6] The scores which are given as tentative norms are those earned by classes in a first course in psychology which have used *Developed Lessons* as their guide to study in institutions which seem to be fairly representative in respect both to student ability and to library equipment. Variation in library facilities, unless very exceptional or very meager, should not materially effect the scores. The tentative norms, as given, are not ideal, but empirical.

was roughly the mid-score or the one which represents the middle of the class numerically. Or to say the same thing in a different way, about one-half of the class had scores of 49 or more and the other half had scores of 49 or less. One-fourth of the 231 students received scores of less than 40 (cf. $Q_1$ 40) and three-fourths of the class had scores of less than 56 (cf. $Q_3$ 56). If, for example, your score is more than 56 you know that you did better than three-fourths of the students whose grades are reported here.

You also wish to know, if you use the system of letters A, B, C, D, E, and F for grades, which one would represent properly your grade. These grades also are given. If your score were 56 then your grade for this test would properly be represented by a " B ", *if you would be compared with the 231 students whose grades are given.* Now plot your score for Test I on the graph or picture record on page 191.

Should members of your class wish to do so, your instructor will help you make similar norms for your own class. From this you can determine two things: first, where you stand in your own class; and, second, whether your class has done better, as well as, or not as well as the 231 students.

It should be emphasized that these tests are not offered as comprehensive measures of general proficiency in the subject. No such use of them is intended. Instead, they are included in order that they can be used by each student to afford him a means to motivate his study and to estimate, for himself, the effectiveness of his own preparation of each topic. If the tests are to fulfill such a purpose it is obvious that if one should not work fairly in every way, in preparing for the test, in taking it, or in scoring it that the value of the test for him has been destroyed. To gain the best value from these tests keep them as genuine and unspoiled measures of how well you have prepared your work. Should you enjoy these objective tests make some for yourself or a friend from material assigned in your work. Making and taking these tests are useful methods of study. But do not let this supplementary work lead to the abuse of the tests given. If these are properly used and if your regular work as tested by them proves satisfactory, you will be reasonably well prepared for your class examinations which your instructor may give you as a partial basis for your course grade.

## SECTION II: BIOLOGICAL FOUNDATIONS OF BEHAVIOR

Why *do* we behave like human beings? We are born wholly 'uncivilized.' We acquire most of what we call human behavior. But without an apparatus for fixed and modifiable behavior we could not acquire this behavior. That is to say, without our anatomical equipment and physiological organization we could not behave as we do. Thus it follows that a knowledge of certain facts of anatomy and physiology are essential to an understanding of human behavior. Another essential is a knowledge of the facts which describe how it is that organisms are born with certain structures which incline or enable them to act in certain ways in response to certain situations — a knowledge of the facts of inheritance.

Section II deals with the essential facts of the biological foundations of behavior. These facts are presented under two topics. Topic III deals with the facts of inheritance. Topic IV deals with our mechanisms of adjustment.

### Topic III: Heredity in the Development of Personality

Man at any given time is the result of the influences of his environment *and* his heredity. To understand the present personality of any individual — to understand his physical, intellectual, or emotional make-up — we must know the facts of his life; the influences of such contributing factors as the home, the school, the street. And, what is sometimes more important, we must know about his heredity — the kind of family he comes from, the abilities and traits of his ancestors. For heredity tells. Tells what? About what? Does it tell in disease? In delinquency? In special abilities and disabilities? In criminality? In insanity? To what extent does it tell? How do we know? How reliable is our knowledge concerning these things?

The foregoing are some of the problems which come up in discussions about the influence of heredity. They cannot be discussed intelligently without a knowledge of (1) the mechanisms of heredity, (2) the principle of heredity, and (3) the methods used in the study of heredity. This is the program for this topic.

*References:*

*Group A*

WOODWORTH — *Psychology,* Chap. V
CHILD — " Individual and Environment " in *The Child, The Clinic, and the Court,* pp. 126–156
PRESSEY — *Mental Abnormality and Deficiency,* Chap. XIII

*Group B*

CONKLIN — *Heredity and Environment*
BOAS — *The Mind of Primitive Man*

The latter group offers somewhat comprehensive treatment of the problems of this topic and are representative of the viewpoints of genetics and anthropology respectively. From them the student can obtain basic knowledge for an intelligent interpretation of cultural data.

The former group offers the student reliable information regarding what biology has to tell of the following subjects and others: (1) Mendel's Laws of Heredity; (2) Galton's Laws of Inheritance; (3) Weissman's Germ-Plasm theory; (4) The Inheritance of Acquired Characteristics; (5) De Vries' Mutation Theory; (6) The Development of the Human Being from the Germ Cell; (7) The Physiological Processes of Metabolism, Reproduction, and Irritability. These are discussed the more fully in Conklin's *Heredity and Environment.*

### 1. HEREDITY AND ENVIRONMENT IN THE DEVELOPMENT OF PERSONALITY

Study each of the following statements critically. Do you accept respectively as true, in whole or in part; or are they false, in whole or in part? Be prepared to present your conclusions and to discuss any statement which you believe to be partly true and partly false.

1. Heredity, not environment, shapes the human race. (Darrow)
2. Environment is more important than heredity in the development of personality.
3. The organism is inexplicable without environment. (Child)
4. Every characteristic of the organism has some relation to environmental factors.
5. Environment provides the opportunity for the development of hereditary traits.
6. Heredity is the relation of organic continuity between successive generations, the living on of the past in the present, the flesh and blood linkages between an individual and his followers on one hand and his offspring on the other. (Thomson, *Outline of Science*)
7. Heredity is the reproductive relation which secures that like tends to beget like and yet seldom does. (Thomson, *Outline of Science*)
8. Some traits or peculiarities are inheritable, others are not.
9. Man is able to see because of original nature; what he sees is dependent on environment. (Thorndike)
10. If evolution stopped, there would be no heredity.
11. Without heredity there would be no evolution.
12. Heredity is not so much a factor in evolution as it is a condition.

What is meant by biological inheritance? Name six traits of your own which you can properly attribute to biological inheritance.

1..... 4.....
2..... 5.....
3..... 6.....

How do you distinguish biological inheritance from social inheritance? Name six traits that you have received from social inheritance.

1..... 4.....
2..... 5.....
3..... 6.....

## II. MECHANISMS OF HEREDITY

There are two aspects of organic development. What are they? Which one is of special importance in the study of the development of a human being from germ cells? From what does life come? In what way does the development of an individual plant or animal begin? How does the oosperm come into being? What is it that Conklin calls "a miracle of development more wonderful than any miracle of creation"?

Which determines the pattern of an animal — the sperm or the egg? Why are we vertebrates? Is it the sperm or the egg that determines the color of our hair, color of our eyes, our stature, etc.?

What determines the sex of an organism? Is there a chromosome which determines sex? How many types of chromosomal determiners are there? Which — the male or female — is usually hymozygous? Which, usually, is heterozygous?

The physiological processes by which all living things maintain the equilibrium of their complex systems are: (1) metabolism, (2) reproduction, and (3) irritability. Just what does each of these terms mean? Are any of them synonymous? Are they mutually exclusive? Are they mutually interdependent? How, or how not?

Can impressions on the mother's mind be transmitted to the unborn child's body or mind? What common errors have contributed to the formation and perpetuation of false beliefs regarding this question? How do you explain the marks or defects whose origin is attributed to maternal impressions? Do these phenomena appear when by hypothesis they ought to? What do geneticists have to say about maternal impressions?

Briefly discuss: (1) the Evidence for the Inheritance of Acquired Characters; (2) Hormones as inheritance materials.

## III. METHODS FOR THE STUDY OF HEREDITY

The three outstanding methods for the study of heredity are: (1) Statistical, (2) Experimental, and (3) Cytological or embryological. Before the name of each of the following write

the number to indicate which method for the study of heredity each used.

.....Galton .....Weisman .....Raymond Pearl
.....Karl Pearson .....Bateson .....Mendel

Which method has been most fruitful? What are the relative values of each?

### IV. THE LAWS OF HEREDITY

Biologically are all men created free? And equal? What is the most generally accepted theory of the continuity of the germplasm? How does it explain inheritance?

Criticize or justify the following statements:

(a) "There really is no inheritance from parent to child; but the parent and child resemble each other because they are derived from the same germplasm, they are chips from the same old block; and the son is the half-brother of his father, by another mother." (Davenport)

(b) "If acquired diseases were heritable, we would all be dead long ago." (Walters)

What does Conklin mean by the statement that "wooden legs do not run in families, but wooden heads do"?

Do average parents tend to produce average children? Inferior parents, inferior children? Superior parents, superior children? Generally, does the progeny inherit peculiarities in less or more marked degree than manifested in the parents themselves? In which of Galton's Laws of Inheritance is this fact stated? What is his Law of Ancestral Inheritance?

Mendel and his followers used hybrids in their experimental work as a device for easy recognition of the contribution of each parent. Their findings are generalized in the form of three fundamental ideas known as Mendel's Laws of Heredity. What are these laws? State and briefly discuss each one of them.

The fact that certain traits or characteristics "skip" a generation is explained by what law? What law explains phenomena of reversion and atavism?

The following statement from Walters describes what law, "Hereditary characters are usually independent units which

segregate out upon crossing regardless of temporary dominance"?

Two brothers have the same ancestors; do they have the same heredity?

Mendel's laws explain how heredity works usually. What explains the appearance of new forms by sudden leaps?

### V. THE INHERITANCE OF MENTAL TRAITS

What does Davenport say about the inheritance of mental traits? What do studies of siblings show? What do studies of eminent persons show? What do studies of mental defectives show? Is insanity a simple defect? Can it be eliminated from the general population? Could albinism? Is every family in which it occurs to be regarded as unsound?

An individual has a love affair. He "goes to pieces" mentally. Other individuals have love affairs and thrive. Why? Is love a cause of insanity? What are predisposing causes? What are exciting causes?

Write a "P" before each of the following which are predisposing causes and an "E" before each of the causes which you believe to be primarily exciting causes:

| | |
|---|---|
| .....Physical stress | .....Oncoming senility |
| .....Heredity | .....Syphilis |
| .....Alcoholism | .....Morbid emotional development |
| .....Stress of childbirth | |
| .....Worry | .....Highly competitive living |

May a predisposing cause also be an exciting cause? Illustrate.

### VI. LIST OF CONCEPTS IN TOPIC III

Review the following concepts. Test yourself on your ability to state clearly and concisely, or to explain to your discussion group or class, the precise meaning of the following terms. Heredity as a condition in evolution; Ontogeny; Phylogeny; Development of human being from germ cell; Share of egg and sperm in development; Sex determination; Physiological processes of metabolism, reproduction, and irritability; Inheritance of acquired characters; Maternal impressions; Methods for

Individual – (2) Race

study for heredity; Galton's principles of heredity; Dominance; Segregation; Principle of unit characters; Weissman germplasm theory; Predisposing and exciting causes of abnormal mental states; Child's concept of "physiological gradient"

## Test II: Heredity In the Development of Personality

Directions. Place a plus sign before true statements and a minus sign before false statements.

### Part I

1. Heredity, not environment, shapes the human race.
2. Training is not nearly so important as good heredity as far as morality is concerned.
3. General moral defect frequently involves intellectual inferiority.
4. Many facts of heredity are explained in biology by maternal impressions.
5. Some traits or peculiarities are inheritable, others are not.
6. Conklin's *Heredity and Environment* is a study in phylogeny.
7. It is a biological fact that there must be tissue for every function.
8. We are vertebrates because our mothers are so and produced eggs of vertebrate pattern.
9. The original abilities of ancient civilized peoples were probably very little different from original abilities of modern civilized people.
10. An organism is inexplicable without environment.
11. The female is usually heterozygous.
12. Only differentiations of later development are influenced by sperm.
13. Men with fine social advantages can achieve eminence whether endowed with high natural gifts or not.
14. Without heredity there would be no evolution.
15. The belief of intellectual inferiority of women is apparently unfounded.
16. The theory of the inheritance of acquired characters has been definitely established.
17. Musical training of parents increases innate musical capacities of the children.
18. Compensation between heredity traits was established by Emerson.
19. In a democratic state children differ but little from each other in native mental capacities.
20. Galton is the founder of the scientific study of heredity.

21. In general, peculiarities of parents are more extreme in children.

22. In the study of lower organisms Mendel's approach to the study of heredity has proved to be the most fruitful.

23. Germ cells if starved may produce stunted individuals.

24. Cunningham has a theory of hormone modification of heredity.

25. Biologically all men are created free and equal.

26. Parent and child resemble each other because they are derived from the same germplasm.

27. Average parents tend to produce average children.

28. Superior parents always produce superior children.

29. Mendel used hybrids in his experimental work.

30. The fact that certain characters skip a generation is explained by the law of segregation.

31. Reversion and atavistic phenomena are explained by the law of Ancestral Inheritance.

32. The appearance of new forms by sudden leaps is explained by the Law of Dominance.

33. Insanity is a simple defect.

34. Galton's laws take into account dominance and segregation and the consequences it entails.

35. Only a relatively small number of the thousands of ancestors that each person has contribute anything to his inheritance.

36. There is no doubt that certain diseases run in families and have the appearance of being inherited.

37. Genius is sometimes associated with an unstable nervous organization.

38. Heredity is the largest single discoverable cause for feeble-mindedness.

39. The units contributed by two parents segregate in the germ cells of the offspring without having had any influence on each other.

40. Marriage with related blood is always dangerous.

## Part II

DIRECTIONS. (a) In the parentheses at the end of each line write the number of the one response which does not belong with the others; (b) on the line below give the reason as shown in example.

Example: 1. Sunday 2. Monday 3. Tuesday 4. August 5. Friday ( 4 )
Reason: August is the name of the month; the rest are days.

I. 1. Metabolism 2. Reproduction 3. Inhibition 4. Irritability ( 3 )
Reason:

II. 1. Statistical 2. Experimental 3. Embryological 4. Psychological ( 4 )
Reason:

III. 1. Hereditary 2. Loss of job 3. Syphilis 4. Morbid emotional development ( 2 )
Reason:

IV. 1. Conklin 2. Thompson 3. Walters 4. Gates ( 4 )
Reason:

V. 1. Ontogeny 2. Phylogeny 3. Heredity 4. Creation 5. Evolution ( 4 )
Reason:

VI. 1. Dominance 2. Segregation 3. Mutation 4. Unit characters ( 3 )
Reason:

VII. 1. Native ability 2. Opportunity 3. Training 4. Environment ( 1 )
Reason:

VIII. 1. Pearson 2. Weissman 3. Galton 4. Pearl ( 2 )
Reason:

IX. 1. Defective mentality 2. Degeneracy 3. Criminal tendencies ( 1 )
Reason:

X. 1. Color of hair 2. Color of eyes 3. Pattern 4. Stature ( 3 )
Reason:

XI. 1. Irritability 2. Behavior 3. Metabolism 4. Reproduction ( 2 )
Reason:

## Topic IV: The Behavior Mechanisms of Man or Man's Apparatus for Behavior

To react in a certain way to a certain situation is characteristic of an organism. Each species has certain norms of form and behavior. In any reaction there is involved on the structural side a receptor, a neural conductor, and an effector. Receptors are *receiving mechanisms*. They receive or are sensitive to forms of physical, chemical, or other stimuli for which they are structurally adapted. They are our organs of sensory stimulation and reception. Without them we would be aware of nothing. Without eyes we could not see. Without ears we could not hear. We become aware of neighboring objects through our eyes, ears, nose, etc. Likewise we would not be aware of our equilibrium or of our bodily activities without receptors within the body. Without receptors of the skin we would not be aware of temperature changes or bodily contacts. In short, it is through our sense organs that we receive our impressions of this world. Other bodily organs (muscles or glands), called effectors, bring about the effects or results of these impressions. Muscles and glands are, therefore, called *reacting mechanisms*. The receptors and effectors are connected by the nervous system. That is why the brain, the spinal cord and the peripheral nerves divisions of the nervous system are called *connecting mechanisms*.

In this topic we shall study how these three mechanisms of behavior — receiving mechanisms, reacting mechanisms, and connecting mechanisms — work together and function as one complex mechanism in any act of behavior. For the unit of behavior is, of course, the total reaction.

*General References:*

Gates — *Elementary Psychology,* Chaps. II, III, and IV (Chaps. II, III, and IV)
Woodworth — *Psychology,* Chap. XII (Chaps. II, III, and IV)
Perrin and Klein — *Psychology,* Chap. II
Watson — *Behaviorism,* Chaps. III and IV

For a more detailed treatment of the structure and function of the nervous system:

HERRICK — *Introduction to Neurology*
HERRICK — *Neurological Foundations of Animal Behavior*
LADD AND WOODWORTH — *Physiological Psychology*
SHERRINGTON — *The Integrative Action of the Nervous System*
LICKLEY — *The Nervous System*
STILES — *The Nervous System and Its Conservation*

### I. THE RECEIVING MECHANISMS IN HUMAN BEHAVIOR

*References:*

* GATES — *Elementary Psychology,* Chap. II (II)
* PERRIN AND KLEIN — *Psychology,* pp. 20–39
* WARREN — *Elements of Human Psychology,* pp. 5–8
*Consult* LICKLEY — *The Nervous System,* and HERRICK, *Neurological Foundations of Animal Behavior,* as you find necessary
DASHIELL — *Foundations of Objective Psychology,* Chap. V

Sight, hearing, taste, smell, touch — these according to a popular notion are our "five senses." Upon what basis of classification does such a notion rest? What is the technical idea of a "sense"? Does scientific investigation reveal that we have more or less? Are all sense organs equal in complexity? Which are the most complex? Which, the least? Are receptors usually well protected? Does a sense organ have a high sensitivity to any stimulus or to a particular kind of stimuli? What is meant by inadequate stimuli? What is an adequate stimulus? What are adequate stimuli for the sense organ of vision? For the receptors of hearing?

Draw carefully a cross-section of the eye from the cornea to optic nerve to show its structure. Draw the ear and show the external, middle, and inner ear; locate also the sense organs of equilibrium. Locate, if possible, in the appropriate drawings the following and describe those which cannot be so located:

| *Eyes* | *Ears* |
|---|---|
| Cornea | Drum |
| Iris | Cochlea |
| Lens | Semicircular canals |
| Retina | Utricle |
| Rods | Saccule |

| *Eyes* | *Ears* |
|---|---|
| Cones | Eustachian tube |
| Fovea | Malleus, incus |
| Blind spot | and stapes |
| Optic chiasma | External ear |

Describe the sense organs of equilibrium; the sense organs of smell; the sense organs in the skin. The senses can be classified as follows: (1) Exteroceptors — External senses; (2) Interoceptors — Internal or Systemic senses; and (3) Proprioceptors — Motor senses. How is each of these classes stimulated? Of the following external organs, which are distant and which are contact or contiguous receptors: Organs of vision; Organs of audition; Organs of smell; Organs of touch and pressure; Organs of heat; Organs of cold; Organs of pain? What are the senses and receptors grouped under systemic senses? The motor senses?

Herrick distinguishes somatic receptors from visceral receptors. The visceral are comprised of what systems of the body? The somatic part of the body includes what? Responses elicited by which of these two kinds of receptors adjust the organism to its environment? Which are involved in emotions and feelings? Which are involved in intelligent behavior? Are our senses always sensitive and delicate enough? How has man increased the receiving power of his senses? When is it beneficial to decrease the powers of the senses? How is this done? Why does Herrick call receptors "windows of the mind"?

### II. THE CONNECTING MECHANISMS IN BEHAVIOR

*Rejerences:*

* Gates — *Elementary Psychology*, Chap. III (III) and pp. 93–102 (89–105) in Chap. IV.
* Woodworth — *Psychology* (Chaps. II and III)
* Perrin and Klein — *Psychology*, pp. 39–64

*For further study:*

Dashiell — *Fundamentals of Objective Psychology*, Chaps. VI and VII

### *The Action of the Neurones*

The nervous system is made up of living cells which specialize as conductors. As such they have two special properties: conductivity and modifiability. What are these cells called? Are all neurones of equal size? Of the same shape? Equal in complexity? Do they all conform to a common plan? Does each include a cell body? What are axons? Dendrites? What are the functions of each group? Is the connection between any sense organ and any muscle or gland ever a direct one? Through what does the nerve path from a sense organ to a muscle or gland always lead? The sensory nerve runs from what to what? The motor nerve? When a stimulus is applied to one portion of the neurone a wave of change spreads through it at a considerable speed (125 meters a second in man). This wave of change is passed on from neurone to neurone. What is the place where this transmission takes place called? Communication across the synapse always takes place in one direction. From what to what? What determines the course a particular nerve current takes? According to this explanation does the impulse cross synapses where the resistance is high or low? What does Lashley's work (cf. Perrin and Klein) seem to show? Do synapses direct impulses indiscriminately or over certain specific neurones? Are these routes all of the same size? Are they all inherited?

### *Reactions of Different Levels*

Briefly describe a simple reaction time experiment. The reaction time for responding to sound or touch is how long? For responding to light? Is the reaction time the same for all individuals? For the same individual at different times? What is a "choice reaction"? Is the reaction time for it smaller or greater than it is for simple reactions? What is meant by "associative reaction"? How does the reaction time for it compare with the other two? Explain the difference. Are mental processes of all kinds *reactions?*

The simplest reaction consists of what? Typically is reflex action quicker than simple reaction? What is the implied difference between an action and a reaction? Is reflex action

voluntary or involuntary? Is it conscious? Always? Never? Sometimes? Is it native behavior? Are reflexes uniformly found in normal infants? Are they prompt to respond? Are they simple or complex? Are they difficult or easy to modify? From an introspective point of view, what is a reaction on the first level? Draw a diagram showing the mechanisms and connections involved in a reaction on the first level. From the point of view of the reaction hypothesis what is a sensation?

Where are the central connections of reactions of the second level located? What are the essential differences between reactions of the first and second level? Which takes place in the part of the body more distant from the point of stimulation? Which is more complex? Which more fixed? Which more modifiable? Are reactions of the second level considered learned or unlearned? Draw a diagram demonstrating reactions on the second level. From the point of view of introspection, what is a reaction on the second level?

Where are the central connections of reactions of the third level located? What are the characteristics of reactions of the third level? Learned reactions are of what level? What evidence do you have for your answer? From the viewpoint of introspection what is a reaction of the third level?

Classify the level of each of the following reactions by writing before each the appropriate number or numbers of its level:

. . . . . Contraction of a local muscle caused by a slight prick of the skin
. . . . . Jerk of the leg resulting from pricking the foot of the infant
. . . . . Speaking of the child
. . . . . Vomiting at the sight of a certain individual
. . . . . Grasping reflex
. . . . . Fainting at the sight of blood
. . . . . Walking
. . . . . Jumping
. . . . . Running
. . . . . Writing
. . . . . Studying
. . . . . Shouting in enthusiasm at a football game

Which level of reaction is important in diagnosing disorders of the nervous system? Why?

*The Cerebral Localization of Functions*

From which end of the neural tube is the brain formed? Into what does the after-brain develop? The mid-brain? The end-brain? Is the growth of the brain carried further into the foetal life than growth of other organs? What are the functions of the spinal cord? Of the pons? Of the cerebellum? The greater part of the skull cavity is occupied by what? With what functions is this structure chiefly concerned? What fissure divides the cerebrum into two hemispheres? What other structures give natural boundaries to functional areas as roughly mapped out by neurologists?

Draw such outline maps of the cerebrum as are necessary to locate and name (and where it is possible show the boundaries) each of the following functional areas:

A. General bodily sensory area
B. Visual area
C. Auditory area
E. Gustatory area
F. Olfactory area
G. Speech area

Which ones of the above contain the neurones whose activity is directly stimulated by and correlated with sensations?

Destruction of the primary sensory area of the cortex is commonly believed to result in loss of what function? What is lost in case of destruction of the visual area? What are the two kinds of sensory aphasia? Of motor aphasia? What is the loss of ability to speak called? When the subject knows the words he wishes to say and cannot say them, he is said to have what kind of aphasia? What is sensory or auditory aphasia? In word-blindness the visual stimulus arouses which ones of the following conscious responses: sensations, percepts, images, memories, thoughts? Destruction of sensory areas eliminate what kind of reactions? Motor responses are eliminated by the destruction of what areas? What is agraphia? Apraxia? When the motor areas of the cortex are exposed in the living animal and explored by a pair of electrodes, contractions of various muscles of the body are plainly observable. This method of electrical stimulation cannot be used in studying the functions of the sensory and associational areas. What method is used? Who are some outstanding workers? What does the work of Franz show about the results of the destruction of cortical areas? Lashley reports that the

maze may be learned by a white rat after considerable part of its cortex has been removed. Does the work of Franz and Lashley show that specific motor functions are or are not located in any absolute and fixed way within the motor area?

### *The Integrative Action of the Nervous System*

As we study organisms which represent the higher levels in the scale of evolution, do we find them to have more or less differentiated nervous systems? What are some advantages of a centralized nervous system? In man can pathways through the nervous system be made to *every* organ of response? Is this conduction of nerve impulse in man typical? When does it occur? Is the nervous system of man organized so as to provide for the convergence of impulses from many receptors upon one effector? Briefly discuss (1) facilitation, (2) inhibition, and (3) reciprocal innervation. Explain how these help to make for the integrative action of the nervous system. Justify or criticize the following statement: "In the multicellular animal, especially for those higher reactions which constitute its behavior as a social unit in the natural economy, it is nervous reaction which, *par excellence,* integrates it, welds it together from its components, and constitutes it from a mere collection of organs an animal individual." (Sherrington)

## III. THE REACTING MECHANISMS IN BEHAVIOR

*References:*

* Gates — *Elementary Psychology,* pp. 81–92 (77–89)
* Watson — *Behaviorism,* pp. 54–60 and Chap. IV

*For further study:*

Dashiell — *Fundamentals of Objective Psychology,* Chap. IV

*For a more complete treatment of glands:*

Harrow — *Glands in Health and Disease*
Dorsey — *Why We Behave Like Human Beings,* Chap. IV
Clendenning, L. — *The Human Body,* Chap. IX

### *Muscles*

What are the two muscular systems in the human body? The principal mass of our body is made up of what kind of

muscles? Do muscles usually work in large or small groups? When you throw a ball what responds — your arm and fingers or muscles all over the body? What are reflexes? Extensors? What happens when a given muscular contraction takes place? Briefly discuss: waste products and fatigue of muscles; muscle strain; the neural circuit; "readiness" or "set"; efficiency of our muscles as working machines.

In our internal organs — the stomach, the intestines, the genital and urinary organs, the heart, the lungs, arteries and veins, liver, spleen, pancreas, kidneys, various glands, etc. — what kind of muscles are found? What are the essential differences between the activity of the two kinds of muscles? Is the activity of smooth muscles slow or fast in contraction? In relaxation? The smooth muscles are innervated by nerves which we shall study in detail when we come to the subject of emotions. What are these nerves called?

### *Glands*

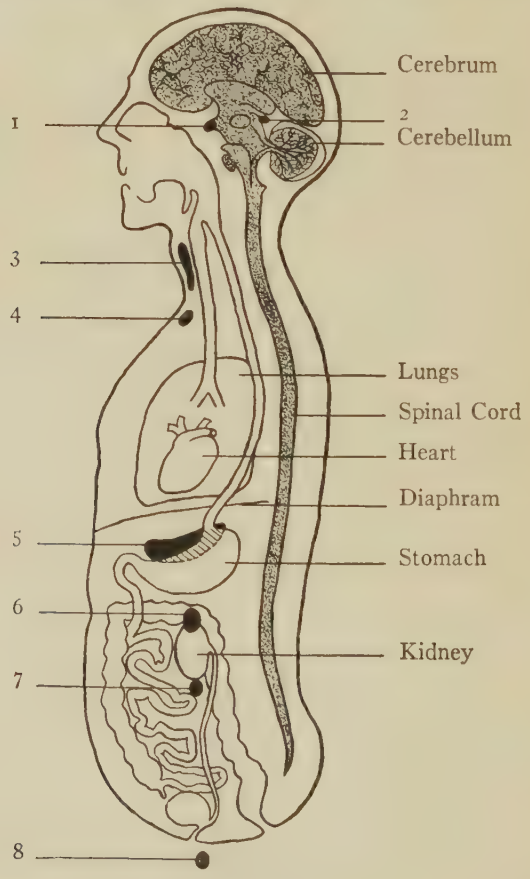
1. **Duct glands.** Show how glands can be called organs of reaction. When muscles react, they contract. When glands react, what do they do? What are two types of glands? What type of glands are tear glands? Sweat glands of the skin? Salivary glands? Digestive glands? Liver? Kidney? Why are they so named? Duct glands are innervated by neurones of which nervous system? When functioning normally do duct glands have much or little specific effect on our behavior? When the function of the glands are disturbed? May our social behavior be affected by such disturbances? Illustrate and explain.

2. **Ductless glands.** In what respect do ductless or endocrine glands differ from duct glands? Do they have any external outlet? Are the secretions from these glands large or small? How do their products get into the body? What are the secretions of the ductless glands called? What are they? Do these glands play a large or small rôle in the nutrition of the body? In growth? What are some of the more important ductless glands? Of all the ductless glands, we know most about the thyroid. What does it secrete? This is composed

largely of what chemical element? Can this be made in the laboratory? If a child is born with deficient or faulty thyroid apparatus what results? This is called what? Does this condition improve with age? What is hyperthyroidism? Myxedema? With what condition is an exophthalmic goiter associated?

## Endocrine Glands

Write the names of the important endocrine glands as indicated by their general positions in the following diagram.



1..... 5.....
2..... 6.....
3..... 7.....
4..... 8.....

Discuss clearly and concisely our present knowledge of the rôle of:

1. The Parathyroid Glands
2. The Pituitary Glands
3. The Adrenal Glands
4. The Pineal Glands
5. The Thymus Glands

### IV. LIST OF CONCEPTS FOR REVIEW IN TOPIC IV

Now is the time to review and to test yourself on some of the material which you have learned in Topic IV. Test your own ability, for example, to state the important facts regarding each of the following terms. Require yourself to do this so thoroughly and so well that one who has not previously studied them would have a reasonably good understanding of them from your description. If there are any topics you cannot explain thoroughly, review them now.

Receiving mechanisms; Connecting mechanisms; Reacting mechanisms; Action of neurones; Reactions of different levels; Facilitation; Inhibition; Reciprocal innervation; Integrative action of the nervous system; Cerebral localization of function; Muscular systems; Action of duct glands; Action of endocrine glands; Interoceptors; Exteroceptors; Proprioceptors; Hyperthyroidism; Hypothyroidism; Giantism and dwarfism; Cretinism; Myxedema.

## Test III. The Behavior Mechanisms of Man

### Part I

Directions. Place the number of the best completions in the parentheses at right.

1. We receive our impressions of the world through our: 1. muscles 2. glands 3. sense organs 4. neurones. ( )
2. The bodily organs which bring about results of these impressions are: 1. receptors 2. axons 3. dendrites 4. effectors. ( )
3. Action depends on: 1. muscle and glands 2. sense organs 3. knowledge 4. reflexes. ( )
4. Receptors and effectors are connected by: 1. glands 2. muscles 3. nervous system 4. receptors. ( )
5. The author of a good book on glands is: 1. Herrick 2. Harrow 3. Gates 4. Warren. ( )
6. The stimulus to which organ is specially adapted is called: 1. adequate 2. abnormal 3. inadequate 4. subnormal. ( )
7. Kind of receptors involved in emotions and feelings: 1. visceral 2. exteroceptors 3. somatic 4. interoceptors. ( )
8. Kind of receptors involved in intelligent behavior: 1. visceral 2. exteroceptors 3. somatic 4. interoceptors. ( )
9. The nervous system of man is made up of living cells which specialize as: 1. receptors 2. conductors 3. effectors. ( )
10. A nerve cell and its branches is called: 1. axon 2. neurone 3. dendrite 4. cell body. ( )
11. Long fibres which conduct nerve impulses from one place to another are called: 1. axons 2. neurones 3. dendrites 4. nerve centers. ( )
12. A small but complex structure which looks after nourishment and upkeep of neurones is: 1. nerve center 2. cell body 3. axon 4. dendrite. ( )
13. A synapse is: 1. a nerve cell and its branches 2. a nerve impulse 3. the junction of two neurones 4. an effector. ( )
14. An impulse crosses synapses where the resistance is: 1. high 2. even 3. low 4. uneven. ( )

15. Synapses direct impulses: 1. indiscriminately 2. differentially 3. indirectly 4. directly. ( )
16. A level of reactions important in the diagnosis of disorders of nervous system is the: 1. first 2. second 3. third. ( )
17. The central connections of reactions of the third level are located in: 1. base of skull 2. brain proper 3. spinal cord 4. peripheral nerves. ( )
18. The central connections of reactions on the second level are located in: 1. base of skull 2. brain proper 3. spinal cord 4. peripheral nerves. ( )

In the following elements numbered 19–26 inclusive, indicate the highest level which each type of behavior most conspicuously illustrates:

1. response of the first level
2. response of the second level
3. response of the third level

19. Speaking of child. ( )
20. Grasping reflex. ( )
21. Jerk of leg resulting from pricking of foot in infant. ( )
22. Contraction of muscle caused by slight prick of pin. ( )
23. Learned behavior. ( )
24. Sensations. ( )
25. Perceptual reactions. ( )
26. Conceptional reactions. ( )

27. Typically reflex action as compared with simple reactions is: 1. quicker 2. slower 3. same speed. ( )
28. Reflexes are: 1. easy to modify 2. difficult to modify 3. impossible to modify.
29. Reflex action is: 1. always voluntary 2. sometimes voluntary 3. involuntary. ( )
30. Reactions on the second level are, as compared with those of first level: 1. easier to modify 2. more difficult to modify 3. equally difficult. ( )
31. The greater part of the skull is occupied by: 1. cerebellum 2. medulla 3. cerebrum 4. pons. ( )
32. The cerebral area which contains neurones whose activity is correlated with sensations are: 1. visual 2. motor 3. gustatory 4. sensory. ( )

33. The loss of ability to speak is called: 1. apraxia 2. aphasia 3. agraphia. ( )
34. When a subject knows the words he wishes to say and cannot get them out he is said to have: 1. sensory phasia 2. apraxia 3. motor aphasia 4. agraphia. ( )
35. In word-blindness visual stimulus arouses: 1. perception 2. images 3. thoughts 4. sensations. ( )
36. Duct glands are innervated by neurones of the following nervous system: 1. central 2. peripheral 3. autonomic. ( )
37. Ductless glands are innervated by neurones of the following nervous system: 1. central 2. peripheral 3. autonomic. ( )
38. An exophthalmic goiter is associated with: 1. hyperthyroidism 2. myxedema 3. cretinism. ( )
39. Giantism and dwarfism are frequently caused by dysfunction of: 1. adrenal 2. pituitary 3. thyroid 4. pineal. ( )
40. The endocrine gland we know most about is: 1. thyroid 2. pituitary 3. thymus 4. adrenal. ( )

## Part II

DIRECTIONS. In the parentheses on the right, place the number of the response which does not belong in the series.

I. 1. receptor 2. effector 3. stimulus 4. response 5. neural conductor ( )
II. 1. cornea 2. drum 3. iris 4. lens 5. retina ( )
III. 1. fovea 2. cones 3. rods 4. saccule 5. blind spot ( )
IV. 1. Optic chiasma 2. saccule 3. utricle 4. semicircular canals ( )
V. 1. organ of vision 2. organ of audition 3. organ of cold 4. organ of smell ( )
VI. 1. organ of heat 2. organ of cold 3. organs of pain 4. organ of smell ( )
VII. 1. organs in muscles 2. organs of taste 3. organs in joints 4. in tendons ( )
VIII. 1. medulla 2. brain 3. spinal cord 4. peripheral nerves ( )
IX. 1. drawings 2. photographs 3. phonographs 4. anesthetics 5. glasses ( )
X. 1. walking 2. jumping 3. writing 4. running ( )
XI. 1. facilitation 2. reciprocal innervation 3. cephalization 4. inhibition ( )
XII. 1. Lashley 2. Gates 3. Franz 4. Herrick 5. Sherington ( )
XIII. 1. smooth muscles 2. duct glands 3. ductless glands 4. sense organs 5. striped muscles ( )
XIV. 1. secretion 2. contraction 3. relaxation ( )
XV. 1. stomach 2. heart 3. lungs 4. liver 5. skeleton ( )
XVI. 1. tear glands 2. adrenals 3. salivary glands 4. digestive glands ( )
XVII. 1. thyroid 2. pituitary 3. salivary 4. pineal 5. adrenal ( )
XVIII. 1. hyper-thyroidism 2. cretinism 3. myxedema 4. Graves' disease ( )
XIX. 1. contact receptors 2. receptors of digestive system 3. receptors of circulatory system 4. receptors of reproductive system 5. receptors of respiratory system ( )
XX. 1. skeletal muscles 2. outside of skin 3. autonomic nervous system 4. cerebro-spinal nervous system ( )

## SECTION III: OUR UNLEARNED MODES OF BEHAVIOR

In the last lesson we concerned ourselves with man's apparatus for fixed and modifiable behavior. With that as a background we are now prepared to study our modes of behavior themselves. Human behavior can be divided into two modes, the unlearned and the learned. In man native behavior is overlaid by habits or learned behavior. This makes it difficult to discover the sources of human urges and cravings — human springs of action. This means that the psychologist who wants to understand human motives must study the origin and development of the capacities and abilities of man. The two methods which have proved most fruitful in this study are the Genetic Method and Comparative Method. The former is used generally in studying infants, the latter in studying animals.

In this section we shall concern ourselves only with some of our unlearned or hereditary modes of behavior; for we shall omit now and later will treat separately that native behavior which can be studied only by introspective methods. Section III will be divided into three topics as follows:

I. The Innate Equipment of Man — including a study of the growth of mind in animals and man.

II. Man's Emotional Life — including the study of the emotional development of the boy and the girl.

III. The Dominant Human Urges — a study of the driving forces of human nature.

### Topic V: The Innate Equipment of Man

In this topic we shall concern ourselves with the study of such problems as the following: To what extent is human behavior the result of inner growth or maturation? To what extent is it the result of learning? How can we distinguish native from acquired traits? What criteria are used by psy-

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chologists? What methods of attack have been used by psychologists who have studied the problem of our original nature? What success have they had? What are some of the more recent developments in this study? What light does the study of animals throw on these problems? The study of infants?

*General References:*

WOODWORTH — *Dynamic Psychology,* Chap. III
GATES — *Elementary Psychology,* Chap. V (V)
WOODWORTH — *Psychology,* Chaps. V and VI (Chap. V)

*For further study:*

DASHIELL — *Fundamentals of Objective Psychology,* pp. 182–214
DORSEY — *Why We Behave Like Human Beings,* Chap. VI
ALLPORT — *Social Psychology,* Chap. III
WATSON — *Behaviorism,* Chap. V
NORSWORTHY AND WHITLEY — *Psychology of Childhood,* Chaps. I and II
KOFFKA — *Growth of the Mind*
HOLLINGWORTH — *Mental Growth and Decline*
GESELL — *Infancy and Human Growth*

### I. NATIVE AND ACQUIRED TRAITS

*References:*

* GATES — *Elementary Psychology,* Chap. V (V)
THORNDIKE — *Educational Psychology* (Briefer Course) Chap. VIII
* KOFFKA — *Growth of the Mind,* pp. 42–49

Generally speaking what modes of behavior are considered native? Are all traits which appear at birth native? Did you consider the influences of parental and preconceptual environment? Is universality a good criterion for distinguishing native from acquired traits? Justify your answer. Are all native traits, then, universal? What evidence do you have for your answer? If a tendency appears without opportunity to be learned, is it considered native? Illustrate. Can a tendency first function some time after birth and yet be native? How so? Does the theory of recapitulation explain this fact? What is Thorndike's theory for explaining the date of appearance and

disappearance of native tendencies? What theory does Koffka advocate?

Write the word "native" before each of the following that can be considered native and the word "learned" before each one that is primarily acquired:

| | |
|---|---|
| .....reflexes | .....attention |
| .....emotions | .....customs |
| .....habits | .....Freudian wish |
| .....sensation | .....capacities |
| .....instinct | .....skills |

.....the dominant human urges

Continue the exercise by indicating which of the following traits of Mr. X are native and which are acquired. He:

| | |
|---|---|
| .....is sixty-six inches in height | .....likes his church |
| .....is bow-legged | .....disapproves of lodges |
| .....is dark-haired | .....likes boxing |
| .....is brown-eyed | .....provides meagerly for his wife |
| .....has a scar on his face | .....has tendency to steal |
| .....is easy-going | .....is a sex pervert |
| .....is dishonest | .....likes coffee |
| .....is a good musician | .....dislikes milk |
| .....is patriotic | .....disapproves of dancing |
| .....likes ice cream | |
| .....shuns women | |

What is the difference between native and congenital? Explain fully and illustrate.

Which of the following *italicized* expressions implying original reactions are native and which are not native:

1. "Homecoming" — to the "grad" it involuntarily summons retrospection. Whether it be a year, one score or two score years since he trod the paths and by-paths of his Alma Mater, he *instinctively* turns back to review the days when he was an active, integral part of the institution with which he chose to cast his lot in preparation for the life that was to follow." (from a college daily)

2. A bee finds its way home *instinctively* and makes for it in a "bee line."

3. Dixon is good at football; it is *instinctive* with him.
4. All good patriots love their country *instinctively*.
5. To Harold oil is *instinctively* repulsive.
6. We are all religious by *instinct*.
7. Every morning Jones puts his shoes on *instinctively*.
8. The artist paints *instinctively*.
9. The child plays *instinctively*.
10. Mary knows how to eat properly by *instinct*.

## II. THE GROWTH OF THE MIND IN ANIMALS

*References:*

* Ogden — *The Meaning of Psychology*, Chaps. VI and VII
* Gates — *Elementary Psychology*, pp. 119–124 (120–126)
Robinson and Robinson — *Readings in Psychology*, pp. 75–78

There are two ways of tracing growth of the mind. What are they? Which is used in tracing the growth of the mind in animals? Are the reports by explorers of animals seen by them in strange lands reliable? Who is usually given credit for being the first to make scientific experimentation on animal intelligence? Who made a study of the flying of birds? What did this experiment show? Are mouse-catching reactions of cats and the impulses that go with them native or acquired? What evidence do you have for your answer? How can you explain the fact that the young "hopeful" chick pecks at all small objects while the experienced bird rarely pecks at anything which does not agree with it? Briefly describe the experimental evidence as reported by Breed and Shepard. Are the complex activities of insects considered instinctive? Compared with the chick, insects seem stupid. How does the chick compare with the dog? The dog with the monkey? In which does the congenital arrangement in the brain permit of greater modification of response? Illustrate this fact by comparison of the behavior of the chick with the trial and error learning of the cat in the puzzle box and that in turn with the learning processes of Köhler's monkey-genius, Sultan? How does Thorndike explain animal learning? How does Köhler explain it on the basis of his work with apes?

What do comparative studies of the weights of the brains of

animals show? Does the heaviest brain indicate the greatest degree of intelligence? Elephants and whales have proportionately smaller brains than man but song birds, apes, and mice proportionately larger brains than man. Does this show that the relatively larger brains are sure indicators of a greater degree of intelligence? Does the weight of the brain in proportion to the spinal cord increase or decrease as we go up the biological scale? Do persons with low mentality always have small brains? The average weight of women's brains is less than that of man's. Does that prove that women are mentally inferior to men? Ontogenetically what can be said concerning the relationship of brain weight and intelligence?

Justify or criticize the following statement made by Thorndike in his *Animal Intelligence:* "Amongst the minds of animals that of man leads, not as a demigod from another planet, but as a king from the same race."

### III. MENTAL GROWTH IN MAN — MATURATION VS. LEARNING

*References:*

KOFFKA — *Growth of the Mind,* pp. 38–42
* GATES — *Elementary Psychology,* pp. 108–116 (109–115)
* OGDEN — *Meaning of Psychology,* Chap. IX
THORNDIKE — *Educational Psychology* (Briefer Course) Chap. XXIV

Mental development in man is the result of two influences, maturation and learning. Is maturation independent of an individual's environment? What method of studying child development did G. Stanley Hall and his followers use? How reliable was this method? Why? What method does Watson use? With what results? How do we distinguish the two forms of development? Compare the mental abilities as found in the animal series with those of the human infant. Do organisms low in the scale of the animal series attain mastery of all their capacities? Does the human being during the entire course of his maturation attain a complete mastery of any of his capacities? Does development become more or less a matter of individual acquisition as we go up the biological scale? Are all stages of development attained only by matura-

tion or are there certain stages which are attained only after learning has been added to growth and maturation?

Do the sense organs function at birth? What evidence do you have for your answer? If our sense organs function at birth or shortly after without learning, is there any need for sense training in childhood? Justify your answer. Do most of the endocrine glands function at birth? Which appear to function actively in childhood and die at about puberty? Is the increased speed and efficiency of muscular reaction due largely to maturation or learning? Briefly discuss the importance of man's linguistic heritage. What, in brief, are the known facts of the growth of the brain in man? What are the known facts concerning the growth of intelligence in man?

### IV. MOTIVES, INTERESTS, AND PURPOSES IN ORGANIC BEHAVIOR

*References:*

* Woodworth — *Psychology,* Chap. VI (Chap. IV)
* Ogden — *Meaning of Psychology,* Chap. V
Carr — *Psychology,* Chap. VI

What name is given to that form of behavior in which what is to happen seems to be directing and controlling what is already happening? Does this kind of activity involve "foresight" — if by foresight is implied something which no physical or physiological processes can explain? Does purposeful behavior depend upon the sensory and motor development of the organism? Do organisms, prior to experience, have any knowledge of absent things and conditions which causes them to strive to attain these things? What is the relation of retention to this apparent foresight? Explain what Ogden means by this statement concerning the recognition of a tune heard before: "On the second occasion not only are the later notes influenced by the earlier, but also the earlier by the later." To the same sample of wine, the chemist and connoisseur react differently. Why?

Justify and explain the following statement (Thurstone, *Nature of Intelligence,* p. 9): "While walking to your office, . . . most of the signs, stores, vehicles, and people are indifferent stimuli which are not even perceived because you do not

identify them with your purpose." What determines the selection of our patterns? Does that which stimulates our sense organs have any influence? Does the satisfaction it yields us as integral individuals? What other terms besides "purpose" are used to describe internal states which predispose an individual to certain reactions and against certain others? Conscious purpose is the highest level of such tendencies to reactions. What other levels are described by Woodworth? Illustrate these.

Briefly define: "determining tendencies"; "mental set"; and "readiness." What are delayed reactions, and what light do they throw on the question of predisposed tendencies? What is the relation of motive and reason? Which is thought out and conscious? Which may not be? Do reason and motive "pull together" in higher types of conduct? Illustrate. Do purposes have causes? Do they have effects? What is an interest? What is a need? A conditioned need? Do motives, interests, and purposes fit into the stimulus-response hypothesis?

### V. REVIEW AND SPECIAL CONCEPTS IN TOPIC V

Review the first paragraph of general questions in Topic V. These questions looked very difficult to you before studying the topic. Can you now formulate satisfactory answers to them? Study as in previous chapters your mastery of the following important concepts:

Native traits; Acquired traits; Recapitulation theory; Correspondence theory; Trial and error learning; Growth of mind in animals; Reflexes; Instincts; Habits; Growth of intelligence in man; Motives; Purposeful behavior; Determining tendencies.

## Test IV: The Innate Equipment of Man

### Part I

Directions. Mark plus before correct statements; mark minus before false statements.

1. Life on the purely instinctive level does not exist in contemporary society.
2. Habits are more easily acquired in the maturer years of mental life.
3. Man's conduct is instinctive in smaller proportion than that of animals.
4. All traits which appear at birth are native.
5. A native tendency can begin to function some time after birth.
6. All native traits are universal.
7. Native means congenital.
8. Acquired traits are dependent on native traits.
9. All sense organs function at birth.
10. We inherit ideas of right and wrong.
11. If a tendency functions without learning, though it begins some time after birth, it is native.
12. A gifted child is one who does without learning.
13. The weight of the brain in proportion to the weight of the spinal cord increases as you go up the scale of evolution.
14. The purest reflexes are those subject to the least central modification.
15. Man's unlearned modes of behavior are more definite and accurate than those of animals.
16. He has practised dancing until it is instinctive with him.
17. Instincts are less universal than habits.
18. Thorndike used the questionnaire method for studying native behavior.
19. The weight of the brain is a reliable indicator of intelligence.
20. Song birds, apes, and mice have proportionately smaller brains than man.
21. Persons with low mentality always have small brains.
22. All persons with very small brains have low mentality.
23. The period of infancy increases as we go up the scale of animal series.
24. Since our sense organs function at birth, there is no need for sense training in childhood.

25. To the psychologist foresight implies something which no physical or physiological process can explain.

26. Purposeful behavior is dependent on sensory equipment.

27. Prior to experience organisms have knowledge of absent things and conditions which cause them to strive to attain these things.

28. Purposeful behavior is dependent on motor equipment.

29. Reason and purpose "pull together" in highest type of conduct.

30. According to Woodworth motive, interests and purposes fit into an S–R program.

31. Man possesses fewer ready-made adjustments than other animals.

32. The human infant appears instinctively to be curious, to explore, to seek to learn.

33. Swimming by humans is instinctive.

34. Our capacities to acquire facts and recall facts are native.

35. Our percepts and images are native.

## Part II

DIRECTIONS. Complete the analogies in the following elements by writing in parentheses the numbers of the respective answers which bear the same relation to the third word as the second bears to the first.

1. Growth of brain: 12 years as Growth of Intelligence: a. 10; b. 12; c. 14; d. 16; e. 18 ( )
2. Infants: Genetic Method as Animals: a. experimental; b. pathologic; c. statistical; d. comparative ( )
3. Recapitulation Theory: Hall as Utility Theory: a. Köhler; b. Thorndike; c. Koffka; d. Ogden ( )
4. Hall: Recapitulation Theory as Koffka: a. Utility; b. Recapitulation; c. Correspondence ( )
5. Thorndike: trial and error as Köhler: a. Recapitulation; b. Correspondence; c. Utility; d. *Gestalt* ( )
6. Adrenals: Pineal as Pituitary: a Thymus; b. Thyroid; c. Parathyroid ( )

Select the answers for questions 7–11 from the following names of research students to indicate who made each of the studies listed:

a. Köhler; b. Yerkes; c. Breed and Shepard; d. Thorndike; e. Gates; f. Ogden; g. Woodworth; h. Watson.

7. Pecking of chicks ( )
8. Kittens' first attempts to catch mice ( )
9. Mentality of apes ( )
10. Study of infants ( )
11. First experimental study of animal intelligence ( )

For each of the following elements indicate its classification as predominantly a. Native; b. Result of maturation; or c. Acquired.

12. Man's religion ( )
13. Opposition to prohibition ( )
14. Height of Mr. Jones ( )
15. Washington's love for his country ( )
16. Roosevelt's liking for outdoor life ( )
17. Joe's liking for ice cream ( )

18. Mr. Brown's liking for his church ( )
19. Easy-going attitude of John ( )
20. Walking of infant ( )
21. Bee finding way home ( )
22. Musical capacity ( )
23. Table manners of a person ( )
24. Untrustworthiness of Mr. X ( )
25. Edward's hatred of Japanese ( )

## Topic VI: Man's Emotional Life

Under this topic we shall concern ourselves with the study of unlearned modes of behavior which play a very significant rôle in normal as well as abnormal behavior, and in adult as well as child behavior — the emotions. In the past, emotions to many teachers and parents have been nothing more than evils to be subdued or controlled. Many recent studies of the emotions clearly point to one important viewpoint. Emotional development is as important as, and for some individuals more important than, intellectual development. It is the recognition of this fact that is responsible for the development of such institutions as the nursery school, child guidance clinics, habit clinics, and the like.

Much research work on the emotions has been and is being done. One of the most significant contributions was Watson's genetic study which purposed to solve such problems as: With what emotions are we born? How do we acquire new ones? How do we lose our old ones? For our knowledge of the bodily responses in emotions we are largely indebted to Cannon, Sherrington, Pavlov, and their students. A fruitful clinical approach to the study of emotional reactions is the Word Association Test, the product largely of the psychoanalysts — students of Jung and Freud. Ruckmick, Langfeld, and Allport have made studies of facial expressions of emotions. Whatley, Smith, Wechsler, Marston, and others have attempted to measure emotional reactions by studying the physiological functions correlated with emotional reactions such as blood pressure, heart beat, quasi-electrical effects of nerve impulses, respiration, and other physiological changes.

Pressey, Downey, and others have attempted to construct pencil-paper tests of emotions. In this topic we shall study about these contributions and observe how they correlate with the best known theories of emotions, such as the James-Lange and the Emergency theories. A brief treatment of moods, temperament, and sentiment — modes of behavior closely related to emotions — will also be included.

*General References:*

GATES — *Elementary Psychology,* Chap. VII (VII)
WOODWORTH — *Psychology,* Chap. VII (VII)
PERRIN AND KLEIN — *Psychology,* pp. 150–193

*For further study:*

DASHIELL — *Fundamentals of Objective Psychology,* pp. 214–224; 246–260
CANNON — *Bodily Changes in Pain, Hunger, Fear and Rage*
SMITH — *The Measurement of Emotions*
MCCURDY — *The Psychology of Emotions*
ROBINSON AND ROBINSON — *Readings in General Psychology,* Chap. XVIII
MARSTON — *Emotions of Normal People*
KEMPF — *The Autonomic Functions and Personality*

### I. THE NATURE OF EMOTIONS

*References:*

* PERRIN AND KLEIN — *Psychology,* pp. 180–183
* PILLSBURY — *Fundamentals of Psychology,* pp. 503–506

Emotions in man may be observed in two ways. What are they? When we see anger as a flushed face, a loud voice, labored breathing, and tense muscles, we are looking at emotions from what point of view? Are emotions conscious or unconscious? How then can you justify Woodworth's statement that "a person may be angry without knowing it"? Are all organic states emotions? Fatigue, hunger, thirst are deviations from the normal state and practically satisfy Woodworth's definition of an emotion as a stirred-up state of the organism. Yet he does not so classify them. Why not? Does the emotion of anger imply the wanting to strike the offending person? Which of the following describe an impulse and which an emotion: a feeling "somehow"; wanting to do something; organic state; an adjustment of the nerve centers toward a certain reaction; a conscious tendency? Are the organic states in fear and anger different or alike? Are fear and anger aroused by the same stimulus? What impulses accompany each? Typically, does emotion generate impulse or impulse generate emotion? How does Woodworth explain reactions as the fol-

lowing: (a) The continued "jumpiness of an individual after escaping from danger"? (b) Why feeble jokes sometimes arouse hearty laughs? (c) Why almost anything his wife says or does makes the husband cross? What does Woodworth mean by compound emotions? How does he say they are formed? How does Gates treat these? Briefly describe and illustrate the following mental states closely related to emotions: sentiment, mood, passion, temperament. Point out the essential differences between them. What does Gates mean by "general emotionality"? What is the relationship between general emotionality and: Emotional excess? Emotional instability? Adaptive responses?

## II. BODILY CHANGES IN EMOTIONS

*References:*

* Perrin and Klein — *Psychology*, pp. 147–148; 159–171

### *Neurological Foundations of Emotions*

Where have the nerves which are concerned with the internal emotional responses been localized? What are the important organs which this nervous system supplies? Will the heart beat when cut off from the influence of nerve centers? What measure of autonomy does it and other internal organs have? Are they subject to the influence of nerve centers? Each internal organ has a double supply of nerves. What are their respective functions? Is the autonomic nervous system separate from the main nervous system? The autonomic nervous system is divided into three divisions: (1) cranial (2) sympathetic; and (3) sacral. Write after each of the following the name of the division of the autonomic nervous system which is believed to be most largely involved:

Depresses the activity of the heart .....
Stimulates the heart .....
Increases glandular and muscular activities of digestion:
(a) In the upper part of the intestines; .....
(b) In the lower part of the intestines .....
Diminishes these activities in both regions .....

| | |
|---|---|
| Dilates the pupil of the eye | |
| Inhibits digestive secretions | |
| Reduces flow of blood in the alimentary canal | |
| Causes pallor and "goose flesh" | |
| Excretes sweat | |
| Secretes adrenin | |
| Involved in strong emotions like rage and fear | |
| Involved in mild, pleasant states of general bodily tone | |
| Lust and sex excitement | |

Which divisions are antagonistic? Which ones permit of specific innervations of different bodily organs? In which are the effects of innervations most widespread? With what part of the central nervous system is the cranial division connected? The sacral division? The sympathetic division?

### *Internal Changes in Emotions*

Who carried out experiments showing the importance of the emotions upon bodily changes? Normal, rhythmic, churning movements of the stomach may be observed in a cat fed with a substance that is opaque to X-rays. If a dog is now introduced and barks fiercely at the cat, while the cat is kept under observation what happens to (a) The stomach movement? (b) The churning movements of the intestine? (c) Flow of gastric juice? (d) The heart beat? (e) Flow of adrenal secretions? (f) The discharge of sugar in the blood? (g) Change of blood pressure? (h) Breathing? What effect does adrenalin have on the skeleton muscles? When an individual is in a state of anger or fear, does his ordinary strength and endurance increase or decrease? In what sense are these responses preparatory reactions?

### *Outward Expression of Emotions*

Are there general bodily attitudes, gestures, and facial expressions which are characteristic of certain emotions? What are some such expressions? Are any of these expressions universal and fairly constant? How is this fact frequently explained? What does Woodworth mean by calling these "preparatory reactions"? With what theory is this in accord?

According to this theory what purpose does baring teeth by animals, such as the dog or gorilla which have large canine teeth, serve? Nasal expressions in disgust were originally what? Set lips of determination? Did Darwin trace back these expressive movements phylogenetically or ontogenetically? Is the evidence from racial survivals more or less convincing than that from infancy of individuals? Do manifestations of grief in American polite society differ from those in Russia or China? Which is more correct: (1) "The ancestor bites in angry attacks and the child instinctively expresses rage by baring his teeth" or (2) "The child bites and so acquires the habit of expressing rage by baring his teeth"? Wide open eyes in wonder or surprise are an adjustment which provide what? Narrowed eyes in anger? Slowing of breathing in first stages of fear? Pricking up of ears in animals? Turning aside and making a wry face in disgust? Are skeletal expressions numerous or few? Visceral responses depending on smooth muscles and glands? Briefly describe the studies and results of judgments of facial expressions made by Ruckmick; Langfeld; Allport; and Landis.

### III. STUDIES OF EMOTIONAL LIFE OF INFANTS

*References:*

* WATSON — *Behaviorism,* Chaps. VII and VIII

* ROBINSON AND ROBINSON — *Readings in General Psychology,* pp. 93–95; 480–488

#### *Inventory of Emotions*

According to McDougall by what are emotions always accompanied? With what instincts does he couple the following emotions?

| *Emotion* | *Instinct* |
|---|---|
| Fear | ..... |
| Disgust | ..... |
| Wonder | ..... |
| Danger | ..... |
| Subjection | ..... |
| Elation | ..... |
| Tender emotions | ..... |

What other emotions does he list? How does Woodworth consider the emotions? What does he mean by "higher emotions"? According to Gates what are these? What, according to Watson, are our only innate emotional responses? How does Watson treat love? What other psychologist treats it in a similar manner? What does Gates think the evidence shows?

### *Origin of Emotional Reactions*

What method did Watson use in studying emotions? What by their original nature did he discover that infants fear? The hampering of infants' movements is, according to Watson, the one stimulus which evokes what emotion? Stroking of the skin, gentle rocking, patting, and turning the child across the attendant's knee on the stomach are stimuli to what emotion? What are some of the responses to the stimuli for fear? For rage? For love?

### *How We Change Our Emotional Equipment*

If these are our only innate emotional responses, how do you explain the following: (a) hundreds of children fear the dark; (b) many women are afraid of snakes, mice, and insects. In short, how does our emotional life become so complicated?

Describe and give illustrations of what Watson means by:

1. Conditioning emotional reactions
2. Unconditioning emotional reactions
3. Reconditioning emotional reactions
4. Transferred emotional reactions
5. Use of corporal punishment in building negative responses
6. Verbalized and unverbalized behavior in relation to Freud's "Unconscious"
7. Jealous behavior

## IV. EMOTIONAL DEVELOPMENT OF BOYS AND GIRLS

*References:*

* GROVES — *Personality and Social Adjustment,* Chaps. XIII and XIV

MILLER — *The New Psychology and the Teacher,* Chaps. IV and V

Are age divisions of the development of affection in the life history of the normal boy absolute or relative? Is the boy's or the girl's development more simple and less liable to abnormality? Does the boy start with hetero- or homo-sexual affection? The first period usually lasts till about what age? The second period begins at about what age? What is the infantile mother-attitude? What is the father-emulation stage? At adolescence what happens? What is the final stage? How does Miller or Groves explain the fact that many men do not marry while their mothers live? How may the father hamper the boy's first transference of affection?

Briefly describe the four stages in the emotional development of the girl given by Miller or Groves. In what stage does the father have an important rôle to play? Briefly discuss the danger of "crushes on female teachers." Are women more or less introverted than men? Why? How can sex activity be sublimated?

## V. THEORIES OF EMOTIONS

*References:*

* Perrin and Klein — *Psychology*, pp. 151–159
Robinson and Robinson — *Readings in General Psychology*, pp. 456–470

What is the best known theory of emotions? What does this theory say and imply? Does it say that we tremble because we fear or that we fear because we tremble? What proof is there for this theory? Do studies of psychopathic cases prove or disprove this theory? How? What are some of the criticisms of the theory? What does the experimental evidence of Sherrington show? Of Cannon? Are visceral sensations necessary to emotions? Do the following facts prove or disprove the theory and how?

(a) Sherrington cut off all sensations coming from the viscera, skin, and the muscles behind the shoulders of dogs by severing certain nerves. After this operation he could observe no loss of emotions in the animals.

(b) "We may cry in extreme joy as well as in sorrow, or tremble in anger as well as in fear." (Breese)

What is the Emergency Theory of Emotions? On what fact is it based? Who originated it? According to this theory what part does the sympathetic nervous system play?

### VI. THE MEASUREMENT OF EMOTIONS

*References:*

* Perrin and Klein — *Psychology,* pp. 171–183
Allport — *Social Psychology,* pp. 132–140

Words are sign-situations for humans. Are our verbal responses to words that are sources of fear, hatred, and jealousy indicative of emotional reactions? How does the Pressey X–O test apply this fact? What is the word-association method? Where is it frequently used? What are common reactions? Individual reactions? Which are significant from a clinical point of view? What is a complex? What are some complex indicators?

Jung describes two types of personality. What are they? Which is analogous to William James' "tough-minded"; his "tender-minded"; which is "practical-minded"; which "subjective-minded"? Describe some typical reactions of each.

Who made use of the psychogalvanic reflex in studying emotional reactions? What claims does he make for it? What are some other physiological manifestations of emotions which are being investigated for the purpose of measuring emotional reactions? What does Marston's work with blood pressure show? Who studied the gastro-intestinal tone in emotions? Briefly describe the following devices for detecting emotions: (a) plethysmograph, (b) pneumograph, (c) automatograph, (d) cardiograph.

Briefly describe and discuss the Downey Will-Temperament Test.

### VII. SOME PROBLEMS OF EMOTIONAL ADJUSTMENT

*References:*

Cases in such books as:
* Wile — *The Challenge of Childhood,* Division III

ADDAMS, HEALY, WOOLEY, AND OTHERS — The Child, The Court, and the Clinic, pp. 22–36
SAYLES — *The Problem Child in School*
MORGAN — *The Psychology of the Unadjusted School Child*

What is the relationship between emotions and intelligence? Who, generally, have more irrational fears the intelligent and informed or the uninformed? What are some possible effects of emotions such as anger and fear on health? On skill? On thought? On ability to learn? Is emotional stimulation a good remedy for mental inertia? Never? When? Does Belasco think one must experience an emotion in order to act it? Are selfishness, anger, and fear always undesirable? Comment upon this statement from Wile's *Challenge of Childhood:*

"Selfishness is the basis of personal security — it is the essence of self in evolution. Anger is of the greatest moral value when the violation of a sacred principle develops into righteous indignation. Fear is what the courts depend upon when they administer the oath to the witness about to testify, and it is the backbone of the safety first movement."

Describe and discuss a case of emotional maladjustment, preferably from your own experiences.

### VIII. LIST OF CONCEPTS IN TOPIC VI FOR REVIEW

The following list of concepts should be very carefully studied to determine your mastery of some of the essential ideas of this topic: Emotion; Impulse; Organic states; Sentiment; Temperament; Mood; Physiological expressions of emotions; Outward expressions of emotions; Innate emotional responses; Conditioning emotional reactions; Reconditioning; Building negative responses; Verbalized and unverbalized behavior; Emotional development of boy and girl; James-Lange theory of emotions; Emergency theory of emotions; Introversion; Extroversion; Complexes; Psychogalvanic reflexes; Emotional maladjustment.

## Test V: Man's Emotional Life

### Part I

Directions. Mark plus before true statements; minus bebore false statements.

1. Berman's idea of a temperament for each gland is generally accepted by psychologists.
2. The lethargy of visceral behavior explains our "moody" reactions.
3. All organic states are emotions.
4. Each internal organ has a double supply of nerves.
5. Emotions are diseases of the mind.
6. Disuse is a very good method for eliminating fear responses.
7. The higher emotions are now generally considered as mental and motor attitudes.
8. The girl's emotional development is less liable to abnormality.
9. Men are more introverted than women, generally.
10. Fickleness and sensitivity are frequently found in the same person.
11. Adrenalin increases the sensitivity of nerve impulses in skeletal muscles.
12. There are no general bodily attitudes or facial expressions which are characteristic of certain emotions.
13. Evidence favors explaining expressive movements as racial survivals.
14. Skeletal expressions are few.
15. Visceral responses depending on smooth muscles and glands are few.
16. The greatest differences among men are emotional differences.
17. Fatigue is more readily localized than rage.
18. Typically impulses generate emotions.
19. Fear is more readily localized than hunger.
20. The remedy for mental inertia is emotional stimulation.
21. Every emotion has its instinctive side.
22. Certain abnormal individuals experience emotional excitement when there are no external stimuli present to arouse it.
23. Generally the adult has more opportunities for emotional outlets than does the child.
24. The child bites and so acquires the habit of expressing rage by baring his teeth.

25. Slowing of breathing in first stages of fear makes for better hearing.

26. Gates considers sex and joyful emotions identical.

27. Watson advocates corporal punishment as a means of building negative responses.

28. Watson connects jealous behavior with love.

29. Girl crushes on female teachers may result in homo-sexual tendencies.

30. Visceral sensations are necessary to emotions.

31. We may cry in extreme joy as well as sorrow or tremble in anger as well as in fear.

32. Our verbal responses to words that are sources of fear, hatred, etc., are indicators of emotional reactions.

33. Experiments show that there is a decrease in blood pressure during deception.

34. Generally the more informed person has less irrational fears.

35. Belasco thinks one must experience an emotion in order to act it.

## Part II

DIRECTIONS. Before each of the elements in Column B write the number of that element in Column A to which it is most closely related. Place no more than one number before each item in Column B. Mark " o " before the items in Column B for which there are no associates in Column A.

*First Half*

| (*Column A*) | (*Column B*) |
|---|---|
| 1. Best known theory of emotions | .....Rage |
| 2. Way in which the body is adjusted during such emotions as fear and anger | .....A complex of sensations |
| 3. An emotion from the introspective point of view | .....Cannon |
| 4. Originator of the emergency theory of emotions | .....Seclusiveness |
| 5. Physiological expression of emotion. | .....James-Lange theory |
| 6. An indication of introversion | .....To blush readily |
| 7. An indication of extroversion | .....A feeling " somehow " |
| 8. An emotion listed by Watson | .....Variation of capillary pulse |
| 9. One who made research studies of measurement of emotions | .....Emergency theory |
| 10. A way in which an organic state differs from an emotion | .....Leading in social affairs |
| | .....Variation of blood pressure |
| | .....To provide for greatest muscular strength and endurance |
| | .....Coagulation of blood |
| | .....Watson |
| | .....Variation in the size of the pupil of the eye |
| | .....Working steadily at the ordinary tasks of the day |
| | .....Fear |
| | .....Making friends of persons of the opposite sex |
| | .....Is more localized |
| | .....To keep calm during a dangerous situation |
| | .....The stimulus is internal |
| | .....Love |
| | .....Day dreaming |

| (*Column A*) | (*Column B*) |
|---|---|
| | .....Wechsler |
| | .....Sudden changes in mood |
| | .....Smith |
| | .....Impulsiveness |
| | .....Gates |
| | .....To keep a diary |
| | .....Marston |

*Second Half*

| | |
|---|---|
| 1. Method used in tracing complexes | ...J..Ruckmick |
| 2. Significant responses in association tests from a clinical point of view | ...2..Allport |
| 3. Describes impulse | ...4..Lust and sex excitement |
| 4. Describes emotion | ...3..Activity of nerve centers in adjustment |
| 5. Function of the sacral division | ...4..An organic state plus — |
| 6. Function of the sympathetic division | ...5..Wanting to do something |
| 7. Function of the cranial division | ...1..Association method |
| 8. Made a study of judgments of facial expressions | ...2..Individual reactions |
| 9. Made a study of physiological expressions of emotions as means of measuring emotional reactions | ...6..Warren |
| 10. The author of a paper test of emotions. | .....Langfeld |
| | ..10..Woodworth |
| | ...8..Conscious tendency |
| | ...7..Depresses activity of the heart |
| | ...6..Inhibits digestive secretions |
| | ...9..Involved in strong emotions such as fear and anger |
| | ..1...Landis |
| | .....Brunswick |
| | .....Pressey |
| | .....Downey |
| | ...9..Jung |
| | ...A..Thorndike |
| | ....9.Groves |

## Topic VII: Drives Or Urges In Human Behavior

Animals are creatures of instinct; human behavior is based on reason or intelligence. So believed Kant and other philosophers. Later James, McDougall, and others demonstrated that: (1) animals are not entirely creatures of instinct, but that they can and do learn; (2) man is not entirely rational and that much of his behavior is instinctive. Since that time many attempts have been made to reduce all human behavior to a few certain instincts. For example, religious behavior has been reduced to these urges: sex, food, and gregariousness; economic behavior to two: sex and food; and so on. The term instinct has been badly abused. There is very little, if any, agreement as to the meaning of the term, and the number of instincts we have. James and his followers teach that we have many specific inherited instincts. McDougall has a well-known list of his own. Freud and his followers explain human behavior in terms of a single motive force. Certain it is that there are fundamental activities; there are dominant human urges. There are driving forces in human nature. What are they? What are their sources? Which are innate? Which are acquired? What relevant experimental evidence do we have? And what does it indicate? These are the problems which will be considered in this lesson.

*General References:*

- Gates — *Elementary Psychology,* Chap. VIII (VIII)
- Woodworth — *Psychology,* Chap. VI (Chaps. VI and VIII)
- Watson — *Behaviorism,* Chaps. V and VI

*For further study:*

- Thorndike — *Educational Psychology* (Briefer Course) Chaps. II, III, and IV
- Moore — *Dynamic Psychology,* Part V
- Thurstone — *The Nature of Intelligence*
- Bernard — *Instinct*
- Holt — *The Freudian Wish*
- Dashiell — *Fundamentals of Objective Psychology,* pp. 260–274

## I. THE PROBLEM OF HUMAN URGES

*References:*

MARTIN — *Psychology,* Part VII
* ALLPORT — *Social Psychology,* pp. 49–82
* ROBINSON AND ROBINSON — *Readings in General Psychology,* pp. 93–94

### *Theories Concerning Mainsprings of Human Action*

What did the early philosophers who considered man a rational animal say about instincts in human beings? Is instinct the opposite of reason? The opposite of intelligence? What is it the opposite of, if anything? What psychologist considers the instincts the mainsprings of all human conduct? What instincts does he list? How does he classify them? How was his *Social Psychology* received? Is his list and classification now generally accepted? What are some of the criticisms of this list? What school of psychology explains behavior in terms of a single motive force? What name is given this force? Is this theory generally accepted by psychologists? What psychologist explained human behavior in terms of a large list of specific inherited drives? How does Watson define instinct in his psychology? What does he say in *Behaviorism?* How does Gates treat this problem?

### *Characteristics of Fundamental Urges*

What are the original forms of behavior in creatures possessing a nervous system? What are innate responses which involve only a lower arc called? How does Woodworth distinguish reflexes from instincts? Are instincts mysterious innate powers possessed by subhuman animals? Are instincts the result of inherited habit? What theory of biology now not generally accepted does this imply? Are innate responses, reflexes or instincts, dependent on sensory equipment? On motor equipment? Are instincts necessarily useful in a struggle for existence? Are they the result of integration and coördination of nerve impulses and adjustment due to inherited connections between motor and sensory nerve? Comment on the following statements:

(a) Instincts are phylogenetic modes of response.
(b) Instinct is a form and method of habit formation; habit is the way instinct exhibits itself.
(c) Habit can be distinguished from instinct only by a study of origins.

According to the last criterion what would a behavior pattern that has been determined in chromosomes be called? Is it an adjustment in response to pressure of environment? Define: (a) urge; (b) desire; and (c) impulse. Are all urges native?

### *Classification of Human Urges*

Some economists and psychopathologists maintain that self-preservation and reproduction are the only two instincts and that all instinctive behavior belongs under these heads. This implies the classification of native responses from what point of view? Is this in accordance with scientific method? Why or why not? How does Rivers classify the instincts? What is the objection to classifications based on "ends"? Against what sort of classification is Dunlap arguing in the following statement: "Fighting may be a combat for life against an active attack. It may be a struggle for food. It may be a struggle for a female in pursuance of the instinct of sex gratification. It may be combat for a female, but in pursuance of the tendency to beget. It may be a defence of progeny. . . . Or it may be a means of self-assertion. It may be a means toward 'acquisition' or a form of play." What are other possible ways of classifying the instincts.

How does Woodworth classify innate responses? What does he include under responses to organic needs? How does he classify the following: Crying? Sucking? Fatigue? Swallowing? Responses to heat and cold? The so-called herd instinct? Vocalization? Locomotion? Manipulation? Exploration? Of the three groupings which are now generally considered innate responses? How are the others considered? What does Allport mean by prepotent reflexes? Prepotent habits? Briefly discuss his treatment of man's fundamental activities.

## II. EXPERIMENTAL STUDIES OF ANIMAL DRIVES

*References:*

* PERRIN AND KLEIN — *Psychology,* pp. 140–146

Can drives in animals be measured? What kind of incentives do investigators use? Briefly describe the box devised by Moss? To go from where the animal was to the compartment that contained the stimuli designated to arouse the drive, what did the animal have to do? After the rats learned that the crossing plate was painful, how did they react to the following situations: 12 hours without food? 24 hours without food? 48 hours? 72 hours? In a variation of this test which did Moss discover is stronger — a 72-hour hunger drive or 28-volt resistance? In further tests Moss compared strength of various drives and discovered which of the following to be strongest: hunger, sex, or maternal? Were there any individual differences? Which of the following incentives did he discover to be superior: sex, punishment, food?

What was the nature of Simmons' study? Which of the following incentives did she find most effective: bread and milk; freedom; "home"; sex? Were the differences Simmons found among the various incentive groups greater in time or in error records? Why?

Describe the technique used by Cannon and Carlson in investigating the hunger drive and state their results. By whom have the most extensive investigations of hunger contractions from the psychological point of view been made? What did he discover are among the phenomena which occur simultaneously with contractions? What effect then does hunger have on mental activity? Can hunger be controlled? How? How did Cannon discover that "the stomach as well as the mouth waters"?

## III. EXPERIMENTAL STUDIES OF INNATE RESPONSES OF INFANTS

*Reference:*

* WATSON — *Behaviorism,* Chap. VI

Who have made the most significant genetic studies of infants? What preparation does Watson recommend for the

student of human infants? From what source has the best information concerning foetal structure been obtained? How old does an infant prematurely born have to be before it can survive? From the fact that infants do live after that time, what inference does Watson make? As a result of Mrs. Blanton's study of several hundred infants through the first 30 days of infancy, what facts are known about the following responses: (a) Sneezing; (b) Hiccoughing; (c) Crying; (d) Tumescence and masturbation; (e) Voiding of urine; (f) Defecation; (g) Early eye movements; (h) Smiling; (i) Manual responses such as (1) Turning of head, (2) Holding up head, (3) Hand movements, (4) Arm movements, (5) Leg and foot movements, (6) Trunk, leg, and toe movements; (j) Feeding responses; (k) Crawling; (l) Standing and walking; (m) Vocal behavior; (n) Swimming; (o) Grasping; (p) Blinking; and (q) Handedness?

### IV. SOME DOMINANT HUMAN URGES

*References:*

* Gates — *Elementary Psychology*, pp. 223–241 (225–245)
* Woodworth — *Psychology*, Chap. VI (Chap. VIII)
Thorndike — *Educational Psychology* (Briefer Course), pp. 40–49
Watson — *Psychology from the Standpoint of a Behaviorist*, Chap. VII

Briefly discuss (a) The rôle of the sex urge; (b) The urge to secure rest and action; (c) The urge to escape and reject; and (d) The rôle of the organic urges in human behavior.

Discuss the following urges and impulses from these three points of view: (1) Its significance; (2) The evidence for its being innate; and (3) Is it primary or secondary (following the discussion in Gates)?

(a) Collecting and hoarding
(b) The mastery impulses — Urges to excel and succeed
(c) Fighting
(d) Hunting
(e) Habitation
(f) Submissiveness

(g) Sympathy
(h) Parental urges
(i) Gregariousness
(j) Urge to secure social approval

To what extent is imitation innate? How does Thorndike treat the subject of imitation?

What are some results of the thwarting of self-assertion given by Woodworth?

Motivation —

## V. LIST OF CONCEPTS IN TOPIC VII FOR REVIEW

State clearly and concisely, or imagine that you are explaining to your class or study group, and formulate the precise meaning of the following concepts: Drives; Urges; Desire; Instincts; Impulses; Classification of urges in terms of "ends"; Responses to organic needs; Responses to other persons; Play responses; Prepotent reflexes; Prepotent habits; Innate responses of infants; Significance of dominant human urges; Thwarting of self-assertion.

## Test VI: Drives or Urges in Human Behavior

### Part I

Directions. Mark plus before the true statements and minus before the false statements.

1. Instinct is opposed to intelligence.
2. Man's instinctive reactions are overlaid by habits.
3. Instincts are inherited habits.
4. Even simple reflexes as winking may be reinforced or inhibited by central control.
5. An instinct is more complex than a reflex.
6. Instincts are dependent on sensory as well as motor equipment.
7. The simpler the reaction the more it is subject to central modification.
8. Imitation is a simple instinct.
9. Thwarted self-assertion frequently results in emotional maladjustment.
10. Some behavior that looks submissive is really self-assertion in disguise.
11. The gregarious urge determines what we shall do together.
12. Experiments show that cats and dogs learn much by imitation.
13. Man has a smaller number of ready-made hereditary motor adjustments than other animals.
14. Woodworth classifies the instincts by their inner structure and organization.
15. Animals are entirely creatures of instinct.
16. Any reaction may be preceded by an impulse.
17. McDougall thinks our dominant urges are all native.
18. Habit is the way instinct exhibits itself.
19. Dunlap and most psychologists classify instincts according to "ends" or serviceableness.
20. Results of experimental studies of animal drives show sex to be the strongest urge.
21. The number of errors made in going through maze is a more exact index of the strength of an incentive than is the time required.
22. The stomach as well as the mouth waters.
23. The best information concerning foetal structure has been obtained by study of monstrosities.

24. Watson's experiments show swimming with infants to be native.

25. Hiccoughing begins at birth.

26. The crying of one infant in a nursery will serve as a stimulus to set off the rest of the children in the nursery.

27. Masturbation is not possible till puberty.

28. The earliest eye movements are right and left coördinated movements.

29. Infants at birth can support their full weight with either right or left hands.

30. The grasping reflex finally disappears from stream of activity.

31. Psychologists agree that the urge to collect and hoard is native.

32. The urge to care for and to protect begotten children is probably native.

33. The urge to secure rest and activity appears in all animals and is native.

34. An urge is a single and indivisible response.

35. The urges to succeed are practically universal.

## Part II

DIRECTIONS. Before each item in Column B place the number of the item in Column A with which it is most closely related. Place no more than one number before each item.

| (*Column A*) | (*Column B*) |
|---|---|
| 1. Explains human behavior in terms of a single motive force. | ..... Rest |
| | ..... Reproduction |
| | ..... Sleep |
| 2. Explains behavior in terms of a large list of specific inherited instincts. | ..... Preparatory reaction preceding definite response |
| 3. Descriptive of impulse. | ..... Applicable to animals |
| 4. Grouping under classification of urges in terms of ends or serviceableness. | ..... Self-preservation |
| | ..... Struggling |
| | ..... Applies chiefly to specific definite acts |
| 5. Descriptive of urge. | |
| 6. Listed by Allport as a prepotent reflex. | ..... Freud |
| | ..... Decoration of the person |
| 7. Made experimental studies of animal drives. | ..... Suggests a dynamic tendency of more general character |
| 8. Phenomena found by Wada to occur simultaneously with hunger contractions. | ..... James |
| | ..... Increase strength of hand grip |
| 9. Response to organic needs. | |
| 10. Response to other persons. | ..... Gregariousness |
| | ..... Hunger reactions |
| 11. Play responses. | ..... Thorndike |
| | ..... Starting and withdrawing |
| | ..... Moss |
| | ..... Implies readiness to act |
| | ..... Is conscious |
| | ..... Simmons |
| | ..... Rejecting |
| | ..... Carlson |
| | ..... Flow of saliva |
| | ..... Sucking |
| | ..... Exploration |
| | ..... Sensitive zone reactions |
| | ..... Fatigue |

(*Column B*)

.....Cannon
.....Dreaming
.....Sex reactions
.....Crying
.....Vocalization
.....Feeding young
.....Locomotion
.....Manipulation

## Test VII: Review Topics VI and VII

### Part I — Concerning Human Urges

Directions. Below are two paragraphs from which important words have been omitted. These omissions are indicated by the numbers in the parentheses. From the list of responses at the bottom of the page select the correct response in each instance. Write the numbers of responses so selected in appropriate parentheses at the right of the page. Brackets indicate groups of answers among which any order will be considered correct.

Man is not always a rational animal. His behavior is not solely determined by (1). His behavior is motivated by (2), some of which are (3), and some (4). Freud explains behavior in terms of a (5) which he calls (6). As he sees it, all human strivings are tinged with (7). McDougall explains human behavior in terms of thirteen instincts seven of which he says are always accompanied by (8). The instinct of flight, for example, he couples with the emotion of (9). The instinct of curiosity he couples with (10). Three instincts he does not couple with emotions are (11), (12), and (13). The last is especially criticized by psychologists because it implies a (14). The most analytical list of instincts has been worked out by (15). Innate responses may be classified in many ways. A way popular with sociologists is classification in terms of (16) or (17). Thorndike and Woodworth classify innate behavior in terms of (18). Three groupings used by Rivers in classifying innate responses in terms of serviceableness are (19), (20), and (21). Woodworth's three groupings are (22), (23), and (24).

Instincts are dependent on both our (25) and (26) equipment. Man's instinctive reactions are practically at the outset overlaid by (27). Even simple reflexes as winking may be (28) or (29) by central control. The simpler the reaction the less it is subject to (30). Results of experimental studies show (31) to be the strongest urge. Another very important urge is (32). Most organic urges are (33).

1( )
2( )
3( )
4( )
5( )
6( )
7( )
8( )
9( )
10( )
11( )
12( )
13( )
14( )
15( )
16( )
17( )
18( )
19( )
20( )
21( )
22( )
23( )
24( )
25( )
26( )

The urge to care for and protect begotten children is probably (34). Other urges are uncertain or (35). Acquired traits, it should be remembered, are dependent on (36).

27( // )
28( )
29( )
30( )
31( )
32( )
33( )
34( )
35( )
36( )

List:

1. Sensory
2. Reason
3. Libido
4. Fear
5. Construction
6. Thorndike
7. Responses
8. Play responses
9. Reinforced
10. Hunger
11. Habits
12. Reproduction
13. Human urges
14. Acquired
15. Sexuality
16. Wonder
17. Ends
18. Self-preservation
19. Responses to other persons
20. Inhibited
21. Native traits
22. Motor
23. Native
24. Single motive force
25. Emotions
26. Acquisition
27. Social valuation
28. Serviceableness
29. Gregariousness
30. Responses to organic needs
31. Central modification
32. Sex
33. Freud

## Part II

DIRECTIONS. Before each item in Column B place the number of the item in Column A with which it is most closely related. Place no more than one number before each item.

| (*Column A*) | (*Column B*) |
|---|---|
| 1. Physiological expression of emotion. | .....Freud |
| 2. Indication of introversion. | .....Rage |
| 3. Indication of extroversion. | .....Seclusiveness |
| 4. Emotion listed by Watson. | .....Variation of blood pressure |
| 5. Function sacral division. | .....Downey Will-Temperament |
| 6. Function cranial division. | .....Excessive day-dreaming |
| 7. Function sympathetic division. | .....Sleep |
| 8. Paper test of emotion. | .....Fear |
| 9. Response to organic needs. | .....Blush readily |
| 10. Response to other persons. | .....Coagulation of blood |
| 11. Play responses. | .....Pressey X–O test |
| 12. Explains human behavior in terms of a single motive force. | .....Lust and sex |
| 13. Explains behavior in terms of long list of inherited instincts. | .....Involved in mild pleasure states |
| 14. Impulse. | .....Decoration of person |
| 15. Emotion. | .....Variation in size of pupil |
| | .....Love |
| | .....Gregariousness |
| | .....Leader in social affairs |
| | .....Secretes adrenalin |
| | .....Impulsiveness |
| | .....Sucking |
| | .....Works steadily at ordinary tasks of day |
| | .....Crying |
| | .....Thorndike |
| | .....Locomotion |
| | .....Made friends with opposite sex |
| | .....Involved in strong emotions, like anger and fear |

(*Column A*) (*Column B*)

.....Manipulation
.....James
...2...Kept cool in dangerous situation
...6...Depresses activity of heart
...11...Vocalization
...7...Sudden changes of mood
...3...Feeding young
...4...Keeping of diary
...15...Adjustment nerve center
...14...Wanting to do something
...13...Conscious tendency
...12...Organic state
...10...Feeling somehow

## SECTION IV: CHANGING HUMAN NATURE AND BEHAVIOR

In the preceding topics we have studied about man's apparatus for fixed and modifiable behavior and also about his unlearned modes of behavior. In our study of the latter, especially in our discussion of man's emotional life, we touched on the problem which we will consider in some detail in this section, namely, how man changes his nature and behavior. The importance of this problem can hardly be overemphasized. This is especially true in social psychology and in education, but it is generally true in other fields of knowledge to which the facts of psychology apply. Efficiency in learning is one of the major problems in applied psychology. Education practically means habit formation. The significance of habits in social behavior is nowhere better shown than in John Dewey's *Human Nature and Conduct,* a book which stresses the fact that " for practical purposes morals mean customs, folkways, established collective habits." The problem will be treated under two topics arranged as follows:

1. *Learning and Habit Formation*
2. *Economical Methods of Acquiring Skill and Knowledge*

### Topic VIII: Learning and Habit Formation

In our study of mental growth in animals and man we learned that, in the words of Thorndike, " Amongst the minds of animals that of man leads, not as a demigod from another planet, but as a king from the same race." Man, then, is not the only learning animal. All other animals are not merely creatures of instinct. They are in part also creatures of habit. Animals far down in the scale of the animal series can and do modify their behavior; they do learn. The facts brought out by the experimental studies of animal and human learning will be considered in this lesson. Some of the other problems which

will be included are: How do experience and training modify our behavior? What are the fundamental facts of the process of learning? What is the rôle of learning in the process of adjustment? What are the laws of learning? What are the important characteristics of learning. How much change can human nature stand, i.e., to what extent are we creatures or victims of our urges and habits and to what extent are we creators of our habits and thus creators of ourselves?

*General References:*

WOODWORTH — *Dynamic Psychology,* Part IV, pp. 77–104
WOODWORTH — *Psychology,* Chap. IV (XIII)
GATES — *Elementary Psychology,* Chaps. X and XI (X and XI)

### I. LEARNING IN THE PROCESS OF ADJUSTMENT

*Special References:*

DASHIELL — *Fundamentals of Objective Psychology,* pp. 325–355
* ROBINSON AND ROBINSON — *Readings in General Psychology,* pp. 102–106
SEASHORE — *Introduction to Psychology,* Chap. XVI
* BURNHAM — *The Normal Mind,* Chap. VII

*Supplementary Reading:*

JAMES — *Principles of Psychology,* Chap. IV

Generally, what do organisms do when their environment is changed? If poison is injected into a mouse how does the mouse react? If an organism gets into hot water, how does it react? If it gets into cold water? If part of an organism is injured what happens? What are some other illustrations of regulation? Generally speaking, do organisms react in ways that are advantageous or disadvantageous to their welfare? Is the behavior of lower or higher organisms more regulatory? In terms of learned or native behavior analyze a day's work of: a college student; a gambler; a laborer; and a dog. Which plays the more important rôle in our everyday life — our native or our learned equipment? What does Thorndike mean by this statement: "Adaptation, adjustment, regulative change all re-

fer to the effect of the laws of learning to furnish man with successful learning"?

Does the old saying that we are creatures of habit mean that we are victims of our habits? Are we? To what extent are we creators of ourselves? What is a habit? How does Watson differentiate instinct and habit? Upon what are habits based? Are acquired reactions independent of or dependent upon native reactions? What is a conditioned reaction? Does the possession of a habit imply the tendency to use it? Justify or criticize the following quotations from Dewey's *Human Nature and Conduct.*

"Habits form our effective desires and they furnish us with working capacities."

"Habit means special sensitiveness or accessibility to certain classes of stimuli, standing predilections and aversions, rather than bare recurrences of specific arts. It means will."

"Habit is an ability, an art, formed through past experience."

What is the relation of mental adjustment to the development of useful or harmful habits? Are all habits conscious? Can we become aware of all our habits? How? Psychologically, is education the imparting of information or is it the formation of habits of doing and thinking? Does the school help persons in the organization and automatization of habits of error as well as correct habits? What rule does Burnham suggest in this connection? What is the relation between making a habit and breaking one? Where do you expect to find more adaptable controls of conduct — in our innate or our learned equipment? How then can you account for this statement from Dewey: "As a matter of fact it (habit) is precisely that which has greatest inertia, which is least susceptible of alteration; while instincts are most readily modifiable through use, most subject to educative direction"? Is the nature of an individual changed every time his behavior is coerced? What does changing human nature imply?

## II. HUMAN AND ANIMAL LEARNING

*Special References:*

* Perrin and Klein — *Psychology,* pp. 204–218; 243–260

* Ogden — *Psychology and Education,* Chaps. XIII and XIV

* WOODWORTH — *Psychology,* Chap. IV (pp. 296–321)
THORNDIKE — *Educational Psychology* (Briefer Course), Chap. X
* ROBINSON AND ROBINSON — *Readings in General Psychology,* pp. 132–138

### *Some Experimental Studies of Animal Learning and What They Disclose*

How were the facts disclosed by the early studies of animal behavior obtained? Was this a reliable method? Who introduced the experimental study of animal intelligence? What two groups of scientists did this bring together? From the point of view of scientific method was it good or bad procedure to begin the study of the learning process by first experimenting with animals as learners? Who are three of the outstanding animal psychologists? In their experiments, what animals are most frequently used? How are conditions controlled? Cite two experiments that prove that animals as well as man are "adapted at mal-adaptation"? Describe one of these. What experiments show that animals do learn to react to stimuli previously ignored? Describe and discuss the following: the signal experiment; the maze experiment. In his experiments with white rats, what effects did Watson find that shifting the air circulation or modifying the temperature has on the rat's ability to learn? What effect did cutting of the "feelers" have on the performance of rats? By which of the following receptors did Watson conclude that the rat's maze learning could be explained: vision; smell; hearing; contact; kinesthetic? Is his proof considered conclusive? What does it show? Do these experiments and the puzzle box experiment indicate the presence or absence of effective use of ideas by animals in learning? Do they show that animals learn much by imitation? By trial and error? In trial and error learning does the learner foresee what movements are the essential ones?

### *Laws and Characteristics of Learning*

Are the facts of learning reducible to laws? What are the general laws of learning as enumerated by Gates? In what does the simplest form of learning consist? By what law of

learning is this explained? What is an important corollary of this law? Are modifications in the nervous system produced by use retained completely and forever? By what law of learning are these results explained? What is the corollary? Are these laws well established? Do they explain how new reactions are acquired? Do they explain conditioned reflexes? Do they explain conditioned reactions? Do they explain acquired reactions resulting from the elimination of connections by simultaneous association? What are some experiments which illustrate such learning? What does the Minnow-Perch experiment show? Explain the elimination of fear reactions in children. What experiments illustrate learning by elimination without blocking? What other experiments illustrate the inadequacy of the law of exercise to explain all the known facts of learning? Does satisfaction and annoyance affect learning? How? What law is given by Thorndike to explain these facts of learning? Justify the following statement of Thorndike:

"Man is now as civilized, rational, and humane as he is because man in the past has changed things into shapes more satisfying and changed parts of his own nature into traits more satisfying to man as a whole. Man is thus eternally altering himself to suit himself. His nature is not right in his own eyes. Only one thing in it, indeed, is unreservedly good, the power to make it better. This power, the power of learning or modification in favor of the satisfying, the capacity represented by the law of effect, is the essential principle of reason and right in the world."

Give a plausible account for the development of the following behavior: (a) A three-year-old child going into tantrums at the sound of the doorbell. (b) A bright child possessing mathematical ability actually fails easy courses in arithmetic. (c) A seventeen-year-old girl cannot go to sleep unless the mother sits by the bed. (d) A man fumbles a button on his coat whenever embarrassed.

Illustrate the meaning of each of the following subsidiary principles or characteristics of learning: (a) Multiple Response or Varied Reaction; (b) Mind-Set or Attitude or Adjustment; (c) Law of Partial or Piecemeal Activity; (d) Law of Assimilation or Analogy; and (e) Associative Shifting.

### *Human Learning*

Is trial and error learning characteristic of lower animals only? What do Perrin's maze experiments with college students show concerning the presence or absence of trial and error learning in man? In what ways is human learning superior to animal learning? Which has the great modifiability of nervous system? Which indulges in greater mental activity? Which is the quicker learner? The better observer? Which has the more control over impulses? What comparisons can be made between memorizing and maze learning? Discuss trial and error learning in man. Upon what does learning by thinking depend? On what does learning by imitation depend? Thorndike considers all animal learning to be of what variety? What do the results of Ruger's experiments show concerning: (a) presence of trial and error learning in humans; (b) effect of learning by insight; and (c) consciousness and learning?

Do the laws and characteristics of learning explain only the facts of animal learning? Do they explain the facts of association in motor-reactions? In emotional reactions? In informational learning? In perceptual learning? In associative learning? Where do frequency, recency, and intensity fit into a Thorndikian scheme of learning? What are the maxims of habit given by James? How do they support or disagree with Thorndike's laws of learning?

### *Gestalt Psychology and Learning*

Does *Gestalt* psychology explain learning in terms of integration of reflexes? In terms of S–R? Do they regard learning activity as a total experience or a partial experience? Do *Gestalt* psychologists agree with Thorndike that animals do not possess insight? They consider response to a specific stimulus as what? Response, they say, is elicited by what? Is a *Gestalt* nothing more than all the parts of a total situation? What is it? Illustrate.

Who carried out experiments attempting to determine whether organisms respond to specific stimuli or configurations? What subjects did he use? Briefly describe his experi-

ment with the child? How can these results be interpreted? What does Thorndike mean when he says, "All learning is connecting"? To *Gestalt* psychologists what is all learning? There are, then, how many ways of learning? As classified by Ogden what are these? Illustrate the meaning of each.

### III. RATE AND PROGRESS OF LEARNING

*References:*

* Woodworth — *Psychology,* Chap. IV (pp. 321–327)
* Starch — *Educational Psychology,* Chap. XI

How do psychologists present the data concerning the amount, rate, and limit of improvements? Name a minor objection to expressing the rate and progress of learning in terms of amount done per unit of time? How else can it be expressed? How many variables are measured? Name ten mental functions whose learning curves have been studied. Are there learning curves for the acquisition of skill or curves for analytical processes? Are most of the curves studied characterized by rapid initial increase followed by slower progress or by slow progress followed by rapid progress? Is the initial increase more or less rapid with more difficult materials? Why? What are some causes for the initial rapid increase? How does the curve obtained by Ruger in his study of a more complex problem differ from the learning curve for simpler processes? How can the initial period of slow progress be explained? Are plateaus characteristic of all learning curves? How can these "shelves of learning" be explained? What is meant by a "hierarchy of habits"? What light does this throw on the question of limits of improvement? Are short-time, day-to-day fluctuations characteristic of improvement? Are short-time, day-to-day fluctuations characteristic of all learning curves? What is a "physiological limit"? Is an absolute limit of improvement in such skills as typing, writing, etc., possible? Is it found in practice? Is the limit reached in such functions as running, jumping, or tapping? Is there any physiological limit in the acquisition of informaton? Is there a limit to the speed with which the elements may be acquired? Illustrate: (1) negative transfer; (2) positive transfer.

### IV. REVIEW AND LIST OF CONCEPTS IN TOPIC VIII

A. Summarize in an essay of not exceeding six hundred words the essential facts of the topic "Learning and Habit Formation." The best of these should be read in class.

B. Prepare to define and to explain clearly the meaning of each of the following concepts which have been used in this lesson: Regulative change; Significance of habits; Trial and error learning; Law of exercise; Law of effect; Law of readiness; Multiple response principle; Mind set or attitude; Piecemeal activity; Learning by assimilation or analogy; Associative shifting; Rôle of consciousness in human learning: *Gestalt* psychology; Configuration; Measuring rate and progress of learning; Plateaus; Physiological limit; Overlearning; Underlearning; Curve of forgetting; Learning curve; Negative transfer; Positive transfer; Hierarchy of habits.

## Test VIII: Learning and Habit Formation

### Part I

*First Half*

Directions. In the parentheses at the right, place the number of the best completions for the omissions as indicated. Your answers are to be selected from the list of numbered words which follows the test-paragraph.

We learn by (1). Learning takes place only during (2). It is never a (3) process. On the contrary it is always a very (4) process. The acquisition of (5) is the result of (6). Learning to control one's temper or to appreciate music are (7) in the process of (8). In fact what one learns are (9). These are (10) by further repetitions.

1. Generalization
2. Connecting
3. Reacting
4. Inherited
5. Passive
6. Acquired
7. Active
8. Memorizing
9. Weakened
10. Activity
11. Strengthened
12. Information
13. Exercise
14. Economy
15. Verbal
16. Practiced
17. Reactions

1. ( )
2. ( )
3. ( )
4. ( )
5. ( )
6. ( )
7. ( )
8. ( )
9. ( )
10. ( )

*Second Half*

Directions. In the indicated spaces on the right place the number of the correct completions which are to be selected from the list below. Any order of correct answers within the brackets will be counted correct.

The Laws of Learning as named by Thorndike are (1, 2, and 3)
1. . . .
2. . . .

The characteristics of learning as presented by Thorndike are ((4, 5, 6, 7, and 8)
3. . . .
4. . . .

The shape of the learning curve is determined by (9, 10, 11, and 12)
5. . . .
6. . . .

Plateaus in the learning curve are caused by (13, 14, and 15)
7. . . .
8. . . .

Three leaders in *Gestalt* psychology are (16, 17, and 18)

1. Nature of the function
2. Bad habits
3. Thorndike
4. Gates
5. Lashley
6. Exercise
7. Watson
8. Readiness
9. Associate shifting
10. Method of work
11. Köhler
12. Mind-set
13. The ability of the worker
14. Partial activity
15. Assimilation or analogy
16. Concealed progress
17. Ogden
18. Partial activity
19. Koffka
20. Physiological conditions
21. Multiple response
22. Previous training
23. Effect

9. 1
10. 12
11. 23
12. 22
13. 2
14. 16
15. 20
16. 19
17. 11
18. 17

## Part II

DIRECTIONS. Before each item in Column B place the number of the item in Column A with which it is most closely related. Place only one number before each item in Column B.

(*Column A*)

1. Illustration of regulative change.
2. What habits are or imply.
3. What habits are not.
4. Experiments illustrating the fact that animals are adapted at mal-adaptation.
5. Receptor which according to Watson's findings accounts for rat's maze learning.
6. Receptor Watson reported to have no effect on rat's maze learning.
7. Illustration of Law of Partial Activity.
8. Illustrates mind set.
9. Learning by imitation depends on.
10. In accord with *Gestalt* psychology.
11. In accord with Thorndikian psychology.

(*Column B*)

11 Animals do not possess insight
0 Trial and error
10 Consider response to specific stimulus an abstraction
4 Signal experiment
2 Based on reflexes
5 Maze experiment
6 Hearing
7 Studying
8 Spider and tuning fork
6 Smell
1 An organism trying to get out of hot water
4 Minnow and perch
2 Based on past experiences
6 Vision
3 All conscious
2 Special sensitiveness to certain stimuli
1 Poison injected into a mouse produces substances to neutralize poison
9 XI In practice least subject to alteration of our modes of behavior
11 Consider learning as a partial experience
9 All susceptible of becoming conscious
1 Rearrangement of materials when part of organism is injured

(*Column B*)

5 ..... More susceptible to modification than instincts
6 ..... Contact
1 ..... A henpecked husband dreams of free love
10 ..... Insight
2 ..... Puzzle box experiment
10 ..... Consider all learning as perceiving
4 ..... Kinesthetic
7 ..... Football fan engrossed in observing player making touchdown
11 ..... Consider all learning is connecting
11 ..... Explains learning in terms of integration of reflexes
8 ..... Less efforts spent to escape from confinement by sleepy cat
11 ..... Explains learning in terms of S — R
9 ..... Observation
10 ..... Consider learning activity as a total experience

## Topic IX: Economical Methods of Acquiring Skills and Knowledge

In our efforts to improve and satisfy our wants we find ourselves confronted by complex situations. Satisfactory adjustments to these situations call for more than our full equipment of our unlearned or learned modes of behavior. In the preceding topic we concerned ourselves with such problems as learning as a process of adjustment, the characteristics of animal and human learning, and the rate and progress of learning; all these purposed to throw light on our important ways of forming new modes of behavior. In acquiring these new modes of behavior, whether knowledge or skills, not all people use the same methods. For example, some learn by parts, others learn by wholes; some use short but frequent practice periods, others use few but long ones; some do, other do not, use recitation as an aid in memorizing; some use " crutches " and formal exercises as aids, others do not. Obviously some methods are more economical for some kinds of learning and for some kinds of learners than are others. Which methods can be used most economically? When should the respective methods be used? Should everybody use the same methods? How can they be applied in memorizing or in the acquisition of ideas or of skills or of attitudes? Just what are the known facts? These and related problems will be considered in this lesson.

*General References:*

Gates — *Elementary Psychology*, Chap. XII (XII)
Woodworth — *Psychology*, Chap. III (Chaps. XIV and XI)

*For further study and aid in self-adjustment:*

Dashieli — *Fundamentals of Objective Psychology*, pp. 355–385
Fenton — *Self-Direction and Adjustment*
Lyman — *The Mind at Work*

### I. Nature of Knowledge and of Skills

*Special Reference:*

* Pear — *Skill in Work and Play*, pp. 21–26; Chap. II

How does Pear distinguish between muscular capacity, muscular ability, and skill? Which of these does an individual who has studied Greek but who cannot speak it even passingly well have and which does he not have? Does inability to perform skilled acts prove lack of capacity? What does it show? What does Pear have to say concerning such a faculty as muscular or motor capacity? Concerning "motor-mindedness"? Concerning persons described as being "clever with hands"? "Clever with head"? May a person possess highly organized muscular knowledge without being able to transmit it to others? Why are such skills difficult to communicate to others? Illustrate. Discuss briefly "eidetic images"; "eidetic individuals."

In what way do skill and knowledge resemble each other? What is a person's integrated and systematized collection of his past experiences called? What are a person's organization and integration of bodily habits called? Remembering something means the possession of what? What are the known facts concerning the relation between muscular skill and intellectual skill?

## II. LEARNING AND FORGETTING

*Special Reference:*

* Pear — *Remembering and Forgetting,* Chap. IX

"Memorizing," psychologists tell us, "is one sort of learning." If so, name the laws which explain the processes of learning. Does committing to memory consist merely in rehearsing what we wish to learn? If so, illustrate. If not, what other factors must be considered? Is all thinking of the past remembering? Really, what is remembering? Are all ideas memories? How are ideas of memory produced? Woodworth analyzes the study of memory into what four problems? What does Woodworth mean by the statement, "Not only do we learn by doing and observing, but doing and observing are learning"? What is overlearning? Underlearning? Unintentional learning? Is the intention to remember important? Illustrate. Is retention an active or a resting state? What does Wood-

worth mean by saying, " We carry around with us not the reaction but the machinery for making the reaction " ? What is this machinery that is retained? Show that this is so in the retention of motor skill. In retention of knowledge. Some psychoanalysts tell us that nothing is ever forgotten. What do they mean? Do scientific psychologists agree?

What does Pear have to say about the rôle of repression in forgetting? Discuss the rôle of feeling tone in memory.

What light does the work of Ebbinghaus throw on the subject of forgetting? Is forgetting slower for meaningful or meaningless material? When does forgetting take place most rapidly? Can retentive power be altered by training? How do we get back what he have committed to memory? What characteristic of learning explains much of the phenomena of recall? What is meant by retroactive inhibition? What are some inhibitions which block recall? Does anxiety inhibit or facilitate recall? Distraction? What are some " helps " in recall? Which is lost quicker, the power to recall or recognition? Is recognition a complex or rudimentary part of memory? What facts prove this? How accurately do we recall? Illustrate false recognition.

### III. PROBLEMS OF ECONOMY IN LEARNING

*Special Reference:*

* THOMSON — *Instinct, Intelligence and Character,* Chap. XXIV

#### *Understanding the Materials*

Which can be the more readily learned, meaningful material or nonsense syllables? Who carried out an experiment showing this? What method did he use? Briefly describe this part of the experiment. In the learning of nonsense syllables what do we tend to do that makes for increased efficiency? What aspect of memorizing nonsense syllables is comparable to the acquisition of " higher units " in telegraphy or typewriting? Is trial and error learning present in memorizing? Illustrate how " a familiar act flattens out and tends to become automatic and mechanical "? Which is the more efficient, dull repetition

or observant study directed toward the finding of facts or relationship? What rule for effective study can be deduced from these facts?

*Reading vs. Recitation*

Who carried out an experiment on the value of recitation in memorizing? Does this experiment indicate that the active reciting method of study is or is not relatively economical? Was the advantage more or less marked in the test conducted four hours after study than in the test immediately following the study? Does recitation or reading result in the more permanent retention? Is the advantage of recitation more or less marked in meaningful material than in nonsense syllables? How can the advantages of recitation be explained?

*The Presentation of Materials*

**1. The Application of Principle of Multiple Response.** Is there any evidence which would justify the classification of people into "eye-minded," "ear-minded," or "motor-minded"? How can most of us best be classified? Who made a study of individual differences in imagery? What is meant by concrete mental imagery? Do recent studies indicate that such imagery is indispensable to recall of facts? What is imageless thinking? Can knowledge of a learner's characteristic type of imagery be used to determine the best method of presentation of lesson material to that learner? How, or why not? What use can be made of such knowledge? What, then, is the best way of presenting materials? What principle should be used in the determination of the method of presenting lesson materials?

**2. The Use of Models.** The following variety of models for teaching handwriting is listed by Gates: (1) a perfect copy-book sample; (2) a splendid sample of actual writing; (3) actual writing, but less perfect; (4) actual writing but within range of the child's possible achievement in a month; (5) sight of actual writing movements by the teacher; and (6) moving pictures of the hand in motion. Which of these should be used? What principle may be used for determining the selection? What does Gates advocate, and why?

*Formal Exercises and Use of "Crutches"*

Is the "general power of memory" improved by formal exercises? Why? What is a "crutch"? What is the theoretical basis for the formal exercises in the Palmer Method of teaching handwriting? Will learning these analyzed acts always result in increased efficiency of writing? Does psychology advocate the use of such preliminary exercises? Never? When? Illustrate the use of "crutches" in the teaching of reading; in the teaching of arithmetic. What is the principle for guidance in selection or rejection of "crutches"? On the basis of this, what recommendations does Gates make?

*The Analysis of Difficulties or Errors*

Plateaus are frequently the result of bad habits. How can these be discovered in the case of writing? Reading? Drawing? Shopwork? Athletics? Can examinations be used as means of analyzing errors? Which type of examination, essay or objective, can be more readily adapted for such use? After the errors are discovered, what should be done? What laws are applicable?

*The Organization of Practice or Study*

**1. Length of Practice Periods.** What should be the length of practice periods? How can the desirable length of practice periods be determined? Pyle's experiment reported in Gates indicated periods of what length to be the most productive? Should materials be overlearned? Underlearned? How can the desired amount be determined? Experiments show that spaced repetitions are more or less effective than unspaced? What are some disadvantages of "cramming"? How do these facts affect the length of practice or study periods? What are comparative values of intensive and extensive learning? Which makes for more successful reproduction? For improvement in ability to reason with materials? For larger increase in spread of information?

**2. Whole vs. Part Learning.** In the learning of the following materials has the whole or the part method been found to

be more effective: Memorizing poetry? Memorizing nonsense syllables? Reading? Musical selections? Complicated dance steps? In general, which method is more effective in serial type of learning? What method does Peckstein's experiment with pencil maze indicate is more effective? What factors should be considered before generalizing about this subject? Is the emotional factor of any significance? The complexity of the material or act to be learned? How? State a rule which seems to summarize and utilize the best of both of these methods.

### *Speed vs. Accuracy*

Is the quick learner usually a quick forgetter? Does this hold for all individuals? What do experiments in writing and reading show about the influence of increase of speed on accuracy? Are there any dangers of too much increase: In speed in arithmetic? In speed of reading and comprehension?

## IV. THE DIRECTION OF ATTENTION

*Special References:*

* GATES — *Elementary Psychology,* pp. 76–78 (73–75)
KITSON — *How to Use Your Mind,* Chap. VIII

### *Some Facts About Attention*

Should attention be classified as a part of our innate or learned equipment? Why? Can a man decide for himself what he will pay attention to? Does attention determine the selection of sensations? Are processes not selected entirely excluded from consciousness? How many impressions can be noticed at one time? What does Gates mean by "integrative action of attention"? Of what significance to education is the fact that it is as easy to perceive a complex group of dots arranged systematically as it is to perceive a single dot? Which determines what shall be regarded as the object of attention, the mental attitude, or the physical mass before consciousness? Illustrate each of the four motor reactions in attention.

### *Conditions of Attention*

What are some objective conditions of attention? Which is the greatest factor of advantage in attention? Why? What effect does intensity of stimulus have in attention? Which will have the factor of advantage in attracting our attention: A bright light or a dim one? A strong odor or a weak one? Large or small objects? An object of definite or of vague form? Material related to life of learner or material that is not? Static or dynamic thought materials? Novel or familiar situations? Work with end in view or aimless efforts? Do desire and interest facilitate or inhibit attention? How does earlier education influence attention? Do social standards have any influence on attention? How?

### *Applications of Facts of Attention*

What laws describe the mobility of attention? Do the general laws of reaction apply to attention? Illustrate. What are the stages of development of attention? By what is each influenced? What is: forced attention; free attention? Illustrate each. Which makes for more efficient learning? How?

Justify and explain the following guide for directing attention given by Gates: Attention should be directed to: (1) features which assist in securing correct preliminary orientation, (2) features which help detect errors or success in act, and (3) the general outcome of act.

Explain psychologically why many college students can sing but cannot recite their college songs. Is the skill of tea and wine tasters due to improvement of sense organs through practice, or training of attention? Is the taking of copious lecture notes a help or hindrance to learning? Why? What does Kitson mean by this statement:

"The student is not an absorber of knowledge but is a perceiver and comprehender of meaning"? Name some conditions favorable to study given by Kitson or by Starch. Is the power to concentrate some special mystic faculty or does it mean effective functioning of all mental processes? Will the securing of new information influence attention? Is there any

short, mysterious way of learning to think? Is there no limit to the amount which can be thought? Within these limits how can we learn to think?

### V. MEMORY TRAINING

*Special References:*

* PEAR — *Skill in Work and Play* Chap. V
* SEASHORE — *Introduction to Psychology,* Chap. XVII

To what extent is recall susceptible to training? Recognition? Retention? Committing to memory? Which of the four is most susceptible to improvement? What is developed in advertised memory systems? Is the general power of memory improved? Briefly describe William James' experiment on transfer of training in memory? What do results of later experiments show? Is transfer a fact? How can it be explained? Briefly summarize the conclusions concerning transfer of training in memory. The following is a list of names of rules given by Seashore in his Chapter on "The Learning Process," purposed to serve as a lesson in memory training:

| *Impression* | *Recall* | *Association* | *Recognition* |
|---|---|---|---|
| selection | persistence | relationship | recognition |
| intention | repetition | analysis | reinstatement |
| attention | rigidity | forcing | expression |
| simplification | relevance | larger units | transference |
| primacy | rest | synthesis | forgetting |
| practice | practice | practice | practice |

Discuss each in its relation to the characteristics of learning the principles of economy in learning previously considered.

### VI. LIST OF SPECIAL CONCEPTS FOR REVIEW IN TOPIC IX

To review the essential concepts studied in this lesson and to prepare for the objective tests upon it, study carefully each of the following terms. Consult the appropriate references for further discussion of those which you do not thoroughly understand. Do not spend time upon those which you already know well enough to explain thoroughly to the members of your study group.

Nature of knowledge; Skill; Ability; Capacity; Aspects of memory; Unintentional learning; Retention; Recall; Recognition; Retroactive inhibition; Principles of economy in learning; Whole vs. part learning; Imageless thinking; Eidetic individuals; Use of crutches and formal exercises in learning; Intensive and extensive learning; Cramming; Relation of speed and accuracy in learning; Objective conditions of attention; Subjective conditions of attention; Integrative action of attention; Forced attention; Free attention; Mobility of attention; Transfer of training; Memory training.

## Test IX: Economical Methods of Acquiring Skills and Knowledge

### Part I

Directions. Below are three paragraphs from which important words have been omitted. These omissions are indicated by the numbers in the parentheses. From the list of responses at the bottom of the page select the correct response in each instance. Write the numbers of responses so selected in the appropriate parentheses at the right of the page.

### CONCERNING MEMORY

Memories are (1) which represent the past essentially as it was experienced by him who is remembering. The ideas of memory may have their origin in (2) or they may first come to use as (3). Since memories are (4) of a special kind, many of the principles that are important in the acquisition of other kinds of (5) will apply to (6). Any (7) tends to become fixed if it is often (8), and (9) are no exception to this rule. But the effects of repetition may be (10) as well as (11). Good memory depends upon a wise (12) of what is worth memorizing. The ease with which we are able to memorize any material depends on our previously acquired (13). Sometimes, however, previous (14) interferes with the formation of new memories.

1. ( )
2. ( )
3. ( )
4. ( )
5. ( )
6. ( )
7. ( )
8. ( )
9. ( )
10. ( )
11. ( )
12. ( )
13. ( )
14. ( )
15. ( )

Memorizing which depends largely upon sheer repetition is called (15) memorizing. That which takes advantage of the logical relations of new material to that which is already known is called (16) memorizing. The (17) is a much easier process once we are used to it. But no one ever reaches a point where he can afford to neglect (18) memorizing altogether. There are two important means of training memory. One consists in accumulating sufficient (19) to make more (20) new facts one wishes to memorize. The other consists in adoption of wise (21) of study. Most memory devices such as (22) and (23) are of very (24) usefulness. That is why more meaningful material is (25) rapidly forgotten.

16. ( )
17. ( )
18. ( )
19. ( )
20. ( )
21. ( )
22. ( )
23. ( )
24. ( )
25. ( )
26. ( )
27. ( )
28. ( )
29. ( )

Freudians tell us that nothing is ever forgotten. That what is forgotten is symptomatic of our (26). Our forgetting is thus (27). Scientific psychologists admit that some of our forgetting is of this (28) variety. But they deny its (29).

List:

1. ideas
2. repeated
3. knowledge
4. rote
5. meaningful
6. more
7. wishes
8. universality
9. actual events
10. memory
11. good
12. former
13. methods
14. formal exercises
15. intentional
16. ability
17. variation
18. memories
19. habits or habit
20. bad
21. logical
22. meaningless
23. limited
24. Freudian
25. fears
26. selection
27. information
28. skill
29. latter
30. crutches
31. less
32. unintentional
33. unlimited

## Part II

DIRECTIONS. Before each indicated space in Column B place the number of the item in Column A with which it is most closely related. Place only one number before each item in Column B. Place "o" before blanks in Column B which have no associations in Column A.

| (*Column A*) | (*Column B*) |
|---|---|
| 1. Stage of development in attention. | .//. . Unspaced distribution of practice |
| 2. Example of crutch in reading. | . . . . . Makes for more successful reproduction |
| 3. Example of crutch in arithmetic. | . . . . . Learn by parts |
| 4. Advantage of intensive learning. | . . . / . . Memorizing |
| 5. Advantage of extensive learning. | . . . . . Use of phonetics |
| 6. Most rudimentary form of memory. | . . . . . Sense organ adjustment |
| 7. Phase of memory most susceptible to training. | . . / . . Instinctive and exploratory |
| 8. Phase of memory least susceptible to training. | . . . . . Recall |
| 9. Motor reaction in attention. | . . . . . Teaching syllables |
| 10. Generally speaking is method which is in accord with principles of economy in learning. | . . . . . Recitation |
| 11. Generally not in accord with economical methods. | . . . . . Makes for greater improvement of ability to reason with material |
| 12. Made study of recitation in memorizing. | . . . . . Retention |
| 13. Has chapter in his psychology book proposed to be a lesson in memory training. | . . . . . Counting on fingers |
| 14. Inhibition which blocks recall. | . . . . . Recognition |
| | . . . . . Use crutches |
| | . . . / . . Forced |
| | . . . ? . Learn by wholes |
| | . . . . . Carrying numbers |
| | . . . . . Spaced distribution of practice |
| | . . . . . Make for larger increase in spread of information |
| | . . . . . General attitude |
| | . . . . . Objective interest |
| | . . . . . Very long practice |
| | . . . . . Make materials meaningful |

(*Column B*)

. . . . . Very short intervals
. . . . . Use of avenue of presentation, models, etc. on basis of type of imagery determined
. . . . . Anxiety
. . . . . Woodworth
. . . . . Use perfect copybook samples as models
. . . . . Gates
. . . . . Distractions
. . . . . Opposition to attempts to increase spread of reading on grounds that make for decrease in accuracy
. . . . . Seashore
. . . . . Use actual work which is within range of child's possible achievement as model
. . . . . Robinson
. . . . . Emotional excitement

## SECTION V: HOW WE LEARN TO KNOW

The material of all knowledge is received through our sense organs. That is one of the things we learned back in Topic IV, when we studied about our receiving mechanisms, our apparatus for receiving impressions. In this section we will study about the "how" and "why" of our knowing. As the psychologist sees it there are two basic types of knowing or cognition. First there is the knowing of objects or events which act upon our sense organs at the time of our knowing them. This is called perception. The second type of knowing is called ideation; and it is an activity for which the presence of objects and events is not essential for knowing. In Topic X we will study perception. In Topic XI we will study ideation under the caption of "How We Think."

### Topic X: How We Perceive

*General References:*

Gates — *Elementary Psychology,* Chaps. VI and XIII (VI and XIII

Woodworth — *Psychology,* Chaps. VIII and IX (Chaps. IX, X, and XVII)

*For further study:*

Dashiell — *Fundamentals of Objective Psychology,* Chaps. XIII and XIV

"Mental life," says Woodworth, "consists largely in the discovery of facts new to the individual and in the re-discovery of facts previously observed." And "perception," he later informs us, "is the culmination of the process of discovery." This is another way of saying that perception is involved in most acts of adjustment. A knowledge of the process of how we perceive is, therefore, essential for the student of human behavior.

Because some of the subject matter to be treated in this lesson has been studied by the use of the introspective method, a considerable part of it is entirely omitted in the works of extreme behaviorists. Some is covered, however, by the use of new terminology. On the other hand, the books of introspective psychologists devote more space to the subject matter of this lesson than to any other. In our presentation we shall follow a middle course. We shall study the essential facts concerning some materials which usually are covered in a chapter on sensation but we shall do this as part of the study of how we perceive. This is in accord with results of recent experiments on perception carried out by *Gestalt* psychologists and others. In brief, our program in this lesson will be as follows: (I) A consideration of the nature of perception by studying the relation of it to other conscious processes; (II) A study of our senses and the kind of information that is secured through each of our more important ones; (III) A study of the rôle of feeling in perception; (IV) A study of practiced and corrected perception; (V) A study of some complex forms of perception, such as social and esthetic perception both of which depend on the coöperative activity of a number of senses; and (VI) A study of our errors of perception — illusions.

## I. THE NATURE OF PERCEPTION

*Special References:*

Ogden — *Psychology and Education,* pp. 159–161
* Carr — *Psychology,* pp. 132–134
* Robinson and Robinson — *Readings in General Psychology,* pp. 239–241; 245–246
Seashore — *Elementary Experiments in Psychology,* Chaps. IX and XI

When you perceive a hole, exactly what do you see? When you perceive your friend calling your name, exactly what do you hear? Why is it that you can perceive the meaning of these questions when you could not do so if they were printed in Danish?

Is perception a sensory process? A combined sensory and cerebral process? Is it a conscious activity? Woodworth

defines sensation as the first response of the brain to the external stimulus. Does he mean the subject's first objective response? The first conscious response? Are sensations always conscious? In what sense is sensation the element-unit or atom of experience? Is there any evidence that perception is the unit of behavior? How does Ogden, a *Gestalt* psychologist, attack the process of perception and its relation to sensation or, more accurately, the rôle of sensation in perception? What does Woodworth mean by calling perception " the culmination of the process of discovery "? Discovery of what? What is the beginning of the process of discovery? In what sense is perception what Seashore calls " inceptive interpretation "? In what ways does perception differ from sensation? Illustrate. Does perceptual activity take place only when the stimulus is present? What is a sign-situation? Can sign-situations serve as stimuli for new perception? Where does perception end and ideation begin?

How do you explain the following facts described by Woodworth: If the cortical regions adjacent to the sensory areas are destroyed the individual may see but not know the objects seen; or he may hear and not recognize the words. Again, if the cortical area destroyed is in parietal lobe, adjacent to the sensory area for the cutaneous and kinesthetic sense, he may still " feel " objects but be unable to distinguish an apple from a lump of coal or a folded newspaper from a tin pail. May perceptions change while sensations remain the same? Does perception of a fact mean readiness to act upon it? Usually? In motor aphasia? In apraxia? Does perception of an object precede or follow motor adjustments? Discuss briefly the rôle of imagery in perception. What are " memory colors "? Does perception consist in the recall of images? Is perception knowing the fact? Is it readiness to act? Is it an adjustment to facts as they are? Is it preparation for changing of facts? What does Woodworth mean by calling perception both " a combining response and an isolating response "? Will two persons with different capacities or of different ages perceive the same thing if confronted by the same situation. Why?

## II. OUR SENSES AND OUR PERCEPTION OF SIMPLE SENSORY QUALITIES

*Special Reference:*

ROBINSON AND ROBINSON — *Readings in General Psychology*, pp. 162–225

Since, in our perceptions, we are dependent upon sensory experiences, perceptual experiences often are classified in terms of the sense organs involved. Can they be further analyzed? How?

### *The External Senses*

**1. The Sense of Vision.** Are the great majority of visual experiences simple or compound? Define or explain the meaning of and give an example of each of the following: spatial pattern; temporal pattern; a visual blend; an auditory blend. Which can we do the more successfully, classify colors or arrange them in series? Why? Upon what does skill in color perception depend? Name the four primary or elementary color qualities. What are the two colorless visual qualities? What are the limiting qualities or range of the intensity series? How is the colortone series best arranged? The saturation series? What are the two principal forms of color blindness? For each, state the number of visual sensations experienced. Explain this statement of Woodworth's:

" Everyone is color blind in certain parts of his retina."

Newton found that when white light is passed through a prism it is broken up into all the colors of the rainbow or spectrum. What is the significance of this discovery to a study of visual sensations? Psychologically the number of distinguishable colors in the spectrum is: unlimited? seven? or more than seven? Is the general correspondence complete or is the relationship more complex? Explain.

How are light waves conveniently mixed in the psychological laboratory? Strictly speaking are colors mixed in color mixing experiments? What is mixed? What are positive after-sensations? Negative after-sensations? What is the meaning of adaptation in the study of color sensations? Rod vision? Cone vision? Contrasts?

What are the most widely known theories of color vision? What does each theory assume? To what extent does each explain the known facts of vision? What are the limitations of each?

2. **The Sense of Hearing.** What is sound? How is it measured? What are the two fundamental sets of qualities perceived by the ear? How can the two be distinguished? What comparison does Woodworth make between auditory and visual sensations? To what does he compare loudness? Pitch? Purity of tone? Whose is the best known theory of hearing? What fact is the foundation of this theory? Is the art of tone more elaborate than the art of color?

3. **The Sense of Smell.** What are the stimuli which provoke sensations of smell? What are the six elementary odors given by Henning? Is his work introspective or behavioristic? Is it reliable? Why can one entering a room of foul air discern it more readily than the person who has been in the room for some time? What phenomenon explains this and similar reactions?

*The Internal Senses*

1. **The Sense of Taste.** What are the four elementary taste sensations? What are some compound taste sensations? What is a blend? Why do some people report that chloroform smells sweet when it really has no odor? What phenomenon explains this response of a mother to a child who refused to take a salt solution: "Take it! you taste it only at first and that's all"?

2. **The Senses of the Skin.** Name the skin sensations. What is the best way of isolating the elements of a compound skin sensation? What are cold spots? Warm spots? Pain spots? Touch spots? How could you discover them? Are these the only four elementary skin sensations? What does Woodworth call the "paradoxical cold sensation"?

3. **Organic Senses.** What sensory experiences does Woodworth include under this heading? Are the familiar organic sensations blends or are they elementary? What is the relation between organic sensations and emotions?

*The Motor Senses*

**1. The Muscle or Kinesthetic Sense.** Why does Woodworth say that this might be better called the "muscle, tendon, and joint sense"? What is the function of the muscle or kinesthetic sense? What is "locomotor ataxia"?

**2. The Static Sense.** What are the results of injury to the semicircular canals? What is the cause of "Circus movement"? What causes dizziness? Name six kinds of amusements which are primarily power of stimulation of the static sense.

III. THE RÔLE OF FEELING IN PERCEPTION

*Special Reference:*

* SEASHORE — *Introduction to Psychology,* pp. 107–110

Is perception ever accompanied by feelings of likes and dislikes? Illustrate the fact in perception of odors.

Is feeling subjective? Is it conscious? Is it cognitive? Is an emotion an elementary feeling? What does Woodworth mean when he defines feeling as an undercurrent of consciousness?

How do elementary feelings differ from sensations? Which may be more readily picked out and observed? Which are more readily localized? Which have no sense organs? How can the following be explained: "A toothache and my failure to pass an examination are both painful, but the two varieties of pain are of different nature"? What is the difference and why?

What is a feeling tone? What are the primary likes and dislikes? Are there any original satisfiers and annoyers? Is liking for sweets native? For fragrant odors? For lemonade? Cheese? Olives? Bright colors? Subdued colors? Are primary likes and dislikes independent of instincts?

According to Wundt's tri-dimensional theory of feeling there are six irreducible elementary feelings. What are they? Name some other proposed elementary feelings.

IV. PRACTICED AND CORRECTED PERCEPTION

*Special Reference:*

* ROBINSON AND ROBINSON — *Readings in General Psychology,* pp. 251–254

### *Laws of Learning in Perception*

In everyday life do we attend to everything that we perceive? Is the original perception of a fact a highly conscious response? What happens after practice? What laws and sub-laws explain the facts of practiced perception? Show how each applies: (1) the law of exercise; (2) associated shifting; and (3) response by analogy. Does response by analogy always result in correct adjustment? If not, give an example where it does not. Is "trial and error" applicable in perception? Illustrate. Discuss the rôle of expectation in perception. In corrected perception which is modified, the situation or the response?

### *Reading as Perception*

Whose studies of eye movements in reading has been cited? Do these studies show that the eyes cover reading materials by a series of quick movements and pauses or by a steady movement along the printed line? What is the span of perception? Is the amount of material taken in at a single fixation-pause affected by the maturity of the reader? The difficulty of material? By mind-set? By purpose? The median number of fixations per $3\frac{1}{2}$-inch line in the first grade is how many? For college students? What then is a fundamental demand of efficient reading? Does the duration of fixation-pause increase or decrease with grade? How long is it in the first grade? For college students? What are "regressive movements" in reading? What causes these? Buswell says the development of mature perceptual habits in reading involves three principal factors. What are they? What Buswell calls "fusion habits" in perception of meaning is comparable to what in telegraphy? Why is reading considered a form of perception?

Summarize into a list the changes in perception which result from practice and learning.

## V. SOME COMPLEX FORMS OF PERCEPTION

*Special Reference:*

* Carr — *Psychology,* Chap. VII

### *Perception of Space*

What senses provide stimuli for perception of distance or space? What knowledge must be acquired before the distance of the sounding body can be perceived? What does this show about our ability to perceive *direction* of sound? What is the meaning of "local sign"? Briefly describe the rôle of cutaneous and kinesthetic senses in furnishing data for the perception of spatial facts. Illustrate binocular rivalry and double image. Discuss briefly: (1) the spatial coördination of the senses; (2) the visual perception of size; (3) the visual perception of form; and (4) the perception of motion.

### *Esthetic Perception*

Can the ability to perceive beauty, humor, etc., be trained? What factor or factors limit the amount? Can simple objects produce an esthetic effect? Illustrate.

### *Social Perception*

What qualities or relations are classed as social? Who made the developmental study of social perception described in the general reference? What do the results show? Can trustworthiness, reliability, sociality, humor, and other character traits be reliably perceived? Can we perceive our own traits with any considerable degree of accuracy? What do Hollingworth's experiments show? Briefly discuss the reliability and usefulness of commercial systems of perceiving intelligence and character.

## VI. ERRORS OF PERCEPTION (ILLUSIONS)

*Special Reference:*

* ROBINSON AND ROBINSON, *Readings in General Psychology*, pp. ~~272~~–283 — 339

How can errors in perceiving small differences be explained? If in a series the differences between stimuli gradually decrease, will the number of errors in perceiving it increase or decrease? State Weber's Law. Are all forms of perception

equal in reliability? Briefly describe and discuss the result of Cattell's work on the perception of differences. What are some of the practical inventions that have grown out of this work. Describe one.

What is an illusion? Is an illusion a false sensation or a false perception? Illustrate the following: (1) an illusion due to peculiarities of the sense organs; (2) an illusion due to mind-set; (3) an illusion due to response by analogy; and (4) an illusion due to imperfect isolation of the fact to be perceived. Will knowing the truth often dispel an illusion? Will it assist in desirable adjustment? What is the chief psychological significance of illusions?

In drawings in perspective, persons in the foreground, if of the same real size as persons in background, appear smaller. Why?

What is an hallucination? Do hallucinations derive more or less from association than do illusions? In hallucinations is there any apparent sensory basis?

How can the following experiences described by Woodworth be explained? (1) "You see some beautiful roses in the florist's window and you smell them; the odor fits into the objective situation very well, till you notice that the shop door is shut and the window glass impervious to odors." (2) "You are half asleep, almost lost to the world, and some scenes come before you so vividly as to seem real till its oddity wakens you to the reality of your bedroom."

### VII. CONCEPTS TO BE MASTERED IN TOPIC X

The following concepts are integral parts or are very closely related to the material of this lesson. Review or study them carefully, so that your statements of them will show clear distinctions:

Sensation; perception; conception; memory colors; forms of color blindness; negative after sensations; positive after sensations; rod vision; cone vision; contrast; Ladd-Franklin theory of vision; Elementary color qualities; Nature of tones and noise; Elementary odors; Elementary taste sensations; Skin sense; Cold spots; Warm spots; Pain spots; Touch

spots; Paradoxical cold sensation; Organic senses; Kinesthetic senses; Circus movement; Nature of feeling; Primary likes and dislikes; Binocular rivalry; Double image; Esthetic perception; Social perception; Regressive movements in reading; Local sign; Spatial coördination of senses; Visual perception of form; Perception of motion; Weber's Law; Illusions; Hallucinations; Synesthesia.

## Test X: How We Perceive

### Part I

Directions. In parentheses on the right write the letter which indicates the best answer to each question.

1. Perception is: (a) recall of images (b) knowing the fact (c) readiness to act (d) preparation for changing of facts. ( )

2. The perception of an object usually: (a) follows motor adjustment (b) precedes motor adjustment (c) is parallel with motor adjustment. ( )

3. What is modified in corrected perception is: (a) the stimulus (b) the response (c) the image (d) the connection. ( )

4. A common number of pauses per line for an adult reading an ordinary book is: (a) 5 (b) 10 (c) 15 (d) 20 (e) 25. ( )

5. The main factor in determining the speed with which we read is the speed (a) with which eyes can move (b) the retina can be excited (c) the words can be understood (d) image can be visualized. ( )

6. To make an individual read without articulation movements you should (a) advise him that he is annoying people about him (b) tell him to control himself (c) have him call out simple numbers or letters while reading (d) punish him every time he does it (e) reward success. ( )

Select answers for questions 7–11 from following list: (a) Cannot be readily altered by training (b) can readily be altered by training (c) can be altered with difficulty.

7. Ability to perceive beauty. ( )
8. The length of fixation pauses. ( )
9. The number of pauses per line. ( )
10. The perceptional span. ( )
11. Ability to perceive such traits as sincerity, reliability, etc. ( )

The studies listed separately in questions 12–18 were made by: (a) Thorndike (b) Gates (c) Seashore (d) Henning (e) Stratton (f) Ogden (g) Hollingworth (h)

Ladd-Franklin (i) Buswell (j) Cattell (k) Muscio (l) Carr (m) Brown. ( )

12. A developmental study of social perception. ( b )

13. A study of spatial coördination of senses. ( e )

14. A reliable introspective study of elementary odors. ( a )

15. A study of theories of visual sensation. ( h )

16. A study of eye movement in reading. ( l )

17. A study of the reliability of perception of character traits. ( g )

18. The influence of expectancy in perception. ( k )

19. Synesthesia is (a) native (b) result of maturation (c) acquired. ( c )

20. Psychologically the number of visual sensations are: (a) limited by number of colors in spectrum (b) unlimited (c) limited by possible color combination of pigments (d) limited by sensitivity of the eye. ( d )

21. In total color blindness the number of dimensions is reduced to (a) 5 (b) 4 (c) 3 (d) 2 (e) 1. ( e )

22. "Circus movement" is caused by: (a) excessive stimulation of canals (b) brain injury (c) destruction horizontal canal of ear (d) sensory disease. ( c )

23. Red-green color blindness is: (a) a hereditary disease (b) acquired disease (c) native color sense peculiarity. ( c )

24. The fact that visual perception of size depends on the position of stimulus on retina is demonstrated by: (a) Müller-Lyer illusion (b) vertical-horizontal illusion (c) cube illusion (d) proofreader's illusion (e) double-image phenomena. ( )

## Part II

DIRECTIONS. Before each of the elements in Column B write the number of that element in Column A to which it is most closely related. Place only one number before each element in Column B.

*First Half*

| (*Column A*) | (*Column B*) |
|---|---|
| 1. An example or description of perception | ..... Seeing it is a wet day |
| 2. An example or description of sensation | ..... Rapid recognition of material |
| 3. An example or description of attention | ..... Double image phenomenon |
| 4. Cause of regressive movements in reading | ..... A sensory process |
| 5. A factor in the development of mature perceptual habits of reading | ..... After images |
| 6. An example of illusion due to peculiarities of sense organs | ..... Difficulty of reading material calling for analysis |
| 7. An illusion due to mind set | ..... Burglar-hearing |
| 8. An illusion due to response by analogy | ..... A sensory-cerebro process |
| 9. An illusion due to imperfect isolation | ..... Rhythmical eye movements |
| | ..... Inceptive interpretation |
| | ..... Mistaking cat yowls for crying of a baby |
| | ..... Beginning of the process of discovering facts |
| | ..... Proofreader's illusion |
| | ..... Hearing the sound of a street car |
| | ..... Aristotelian illusion |
| | ..... Culmination of the process of discovery |
| | ..... Wider perception unit |
| | ..... First conscious response to a stimulus |
| | ..... Movies |
| | ..... Takes place only when the stimulus is present |
| | ..... Second conscious response to a stimulus |

| (*Column A*) | (*Column B*) |
|---|---|
| | .....Smelling the odor of beautiful roses in a closed florist's shop |
| | .....Müller-Lyer illusion |
| | .....Selection of stimuli to be perceived |
| | .....Poggendorf's illusion |

*Second Half*

| | |
|---|---|
| 1. Illustration of synesthesia | .....Shape of retinal image |
| 2. A fact explained by double image phenomena | .....Perspective or depth arrangement |
| 3. Native like or dislike | .....Environment or surrounding objects |
| 4. Acquired like or dislike | .....Lemonade |
| 5. Factor influencing visual perception of form | .....Bright colors |
| | .....Personification of inanimate objects |
| | .....Like or dislike of olives |
| | .....Colored hearing |
| | .....Fragrant odors |
| | .....One-eyed persons do not suffer from illusions to solidarity of objects around them |
| | .....Like or dislike of cheeses |
| | .....Visualization of numbers and letters in some fixed scheme and projected into space |
| | .....Subdued colors |

## Topic XI: How We Think

In the preceding lesson we studied about one of our basic ways of learning to know — how we perceive or know objects and events acting on our sense organs. In this, the second lesson on "How We Learn to Know," we will consider the other of the two basic types of knowing, ideation, or the knowing of objects and events not acting directly on our sense organs. Ideation includes more than reflective thinking as treated in logic. We can remember, imagine, and dream of, as well as conceive of things not present and acting on our sense organs. Reverie, night-dreams, day-dreams, creative imagination, and recollection, as well as reasoning, are psychologically types of thinking or ideation. Concerning the nature of many of these types of thinking whole books have been written. In the larger universities entire courses are given which attempt to do nothing more than consider some of these. A study of the nature of these types of thinking, at the present time, involves, among other things, a consideration of two contributions which have not as yet been fully evaluated. These are: (1) The Behaviorists' view of thinking — which involves a study of the relation of thinking and talking structurally and functionally considered, and (2) The contribution of the psychoanalysts to the "what" and "why" of our thinking and dreaming — the rôle of the so-called Freudian Wish in human behavior. What the real significance of either of these may eventually prove to be, we do not know. Our consideration of them will be brief, for at the present it seems that more value can be obtained by studying ideation from other points of view. Some of the more important problems to be treated in this lesson are: (1) What are the conscious processes in thinking? (2) What are the essential characteristics of our various types of thinking? (3) How does the behaviorist describe thinking? (4) What is the relation of our talking to our thinking? (5) What is the value of the fictions we build about ourselves? (6) What are the essentials of reflective thinking?

*General References:*

Woodworth — *Psychology,* Chaps. X and XI (Chaps. XV, XVIII, and XIX)

GATES — *Elementary Psychology,* Chap. XIV (XIV)
CARR — *Psychology,* Chaps. VIII and IX
MARTIN — *Psychology,* Chap. IX

*For further study:*

DASHIELL — *Fundamentals of Objective Psychology,* Chap. XVII
WALLIS — *The Art of Thought*
HOLLINGWORTH — *Psychology of Thought*
DEWEY — *How We Think*
OGDEN AND RICHARDS — *The Meaning of Meaning*
MELTZER — *Children's Social Concepts,* Chaps. I and VIII
DIMNET — *The Art of Thinking*

### I. THE NATURE OF THINKING

*Special References:*

* THOMSON — *Instinct, Intelligence and Character,* Chaps. XII and XIII
* WATSON — *Behaviorism,* Chaps. X and XI

#### *Words and Ideas*

Polynesians regard thinking as "speaking in stomach." Does that belief have any connection with the food restrictions and taboos their magicians have to observe? How? Why do Arabs lie on the ground to let a curse fly over them? Persians think words have inherent medicinal value. Does that belief influence their behavior? Do words in themselves mean anything? Is there any group in America whose beliefs imply faith in verbal medicine?

"Make the world safe for democracy," said Woodrow Wilson. Safe for whom? Safe where? To what extent did this phrase influence man's behavior? What light does this shed on the relation of words, ideas, and reality? On the power of words in influencing human behavior? Briefly summarize what Thomson has to say about the use of words in thought.

#### *Talking and Thinking*

To the Behaviorist what is thinking? What is the *rôle* of laryngeal movements in thinking as Watson describes it? Does removal of the larynx destroy articulate speech? Whis-

pered speech? What evidence does Watson have for his theory?

Is it possible to distinguish between the form of the idea and what the idea is about? How can you explain the fact that some lecturers get their best ideas while lecturing? How does one "think right into the typewriter"? May movements and bodily gestures other than those of speaking serve as ideas? Illustrate. Is the form of ideation always detectable? How can this be explained? Justify or criticize this statement from Robinson: "Ideas are no more in the book when it is not being read than is moving my feet in me when the movement is not taking place." Psychologically, what is the function of language? Does speech mirror thought? To what extent?

### *The Rôle of Concepts in Human Behavior*

Is concept-formation a conscious process? Typically, what arouses concept formation? What are the materials of thinking? The tools of thinking? Are concepts immutable? Stable? Of what are they the result? What else besides objects may they represent? What then is a concept? How do they function in everyday behavior? Do concepts make conduct more or less adaptable? What is the social significance of this in a dynamic society? What is the influence of preconceived ideas and stereotyped meanings on our ability to perceive reality? What is the relation of concepts to (a) instincts? (b) emotions? (c) habits? and (d) mental adjustment?

## II. TYPES OF THINKING AND THEIR CHARACTERISTICS

*Special Reference:*

* PERRIN AND KLEIN — *Psychology*, pp. 303–313

Before each of the following sentences write the name of the class of thinking, according to Perrin and Klein's classification of believing, imagining, judging, and reasoning:

..... "I think the maid is dishonest."

..... "The doctor thinks John has a touch of influenza."

..... "I think the speaker is right."

| | |
|---|---|
| ..... | "I think college football does more harm than good." |
| ..... | "I think I'll play some tennis today." |
| ..... | "I am now thinking of my childhood days." |
| ..... | "John can't leave off thinking of his folks at home." |
| ..... | A student writing a final examination. |
| ..... | A chemist analyzing an unknown. |
| ..... | I think John will make a good teacher. |

On some measure of what are all types of thinking based? They do vary in exactness of reproduction. What is extremely faithful reproduction called? Which is the other extreme? Illustrate the difference between faithful and creative imaginative recall. What is new in imaginative recall? Why cannot a person deaf from birth imagine sounds? Why cannot a person blind from birth imagine colors and shades? What are the known facts about imageless ideational processes?

All types of thinking are in some way connected with man's adjustment to his environment. They differ in extent to which they are controlled by conscious aim or purpose. On what extreme is realistic or directive thinking? What is autistic thinking? What is more characterized by free association? Illustrate the meaning of free association? What are "egocentric responses"? What is the rôle of frequency in association? Recency? Intensity? What is controlled association? Illustrate. In what kind of association, free or controlled, does mental set play a dominant rôle? Is reverie characterized by free or by controlled thinking? Dreaming? Trial and error thinking? Rationalization? Reasoning?

Does reverie make up a small or large part of our mental experience? Typically in normal persons is reverie usually of a pleasant or unpleasant nature? How do psychopathologists regard this building of fictions about ourselves? Does this kind of thinking play an important part in poetry? Does it

greatly aid intelligent behavior? Does rationalization? Why do people who live in rural communities often believe that all large cities are wicked? Why do many prohibitionists believe that all opposed to their doctrine are "bought up by the liquor gang"? Why do socialists believe that all individuals are cowards or else in secret league with capitalists? Why do some capitalists connect up strike-breaking with breaking the constitution? In all these cases is there a facing of reality or escape from it? Is rationalization an aid or hindrance to reflective thinking?

### III. REASONING

*Special References:*

* Woodworth — *Psychology*, Chap. X (Chap. XVIII)
Robinson and Robinson — *Readings in General Psychology*, pp. ~~417–423~~. 367 - 374
* Boas — "From Truth to Probability," *Harper's Magazine*, March, 1927

#### *The Nature of Reasoning*

What does Woodworth mean by the statement that the reasoner is an explorer? Is reasoning a simple or a complex process? Can we learn by reasoning? What is the essential characteristic of reasoning? What other type of thinking is so characterized? How much of our thinking is of the trained animal sort? What is the connection between this and Watson's idea of implicit language habits? Do we carry out all the ideas we ever think of? What is the relation between the idea of an act and its consequences? Does reasoning play a larger or smaller rôle in our everyday behavior than we popularly believe it does? Does it follow that the person who reasons most is always the most efficient person? Which is the better index of intelligence, the amount of time one spends in reasoning or what one reasons about? What is the relation between reasoning and memory? In what does reasoning culminate?

#### *Reasoning as Studied in Logic and Psychology*

In the terminology of logic, what is an inference? What is the relationship between evidence, meaning, and inference?

What is a "major premise"? A "minor premise"? A "syllogism"? How does logic test for the validity of reasoning? How does Boas distinguish Aristotelian logic from statistical thinking? Why is this of special importance to students of psychology?

*The Art of Thinking*

Illustrate the difference between stereotyped thinking and scientific thinking by discussing the problem of "spontaneous generation" as considered by people of his time and as worked out by Pasteur. What is inductive reasoning? Deductive reasoning? Of which form is the principle of gravitation generally cited as an illustration? The principle of vaccination? Which is used the more in mathematics? Which, if either, is the more elementary? What is your evidence? Name a frequent fallacy in inductive reasoning. How may each of the following make sound thinking more difficult: preconceptions; our desires; novelty; high-sounding statements; customary authority; anthropomorphism? What are the qualities of a good reasoner as given by Woodworth? Evaluate the following statements:

"The efficient reasoner must be a good guesser." (Woodworth)

"Science is the growing edge between unknown and known." (Singer)

"Science is not organized knowledge; is process which makes knowledge." (Singer)

"Nothing can be loved or hated unless first we have knowledge of it." (Freud)

"All patrons of the arts and sciences are public benefactors. No poor men are the patrons of the arts and sciences. Therefore, no poor man is a public benefactor." (Creighton)

Is the complete act of thought as described by Dewey necessarily complicated? What are his steps of thinking? What is a "felt difficulty"? Does it impel us to action? What is the cause of thinking? What is the function of hypothesis as a step in thinking? What is the rôle of application and verification in the reasoning process? May conclusions reached by reasoning be qualitative as well as quantitative? Illustrate.

Are all conclusions equal in certainty? Can the degree of certainty be ascertained? How? What is the relation between thinking and doing? What is the rôle of doubt in thinking?

### IV. IMAGINATION AND DREAMS

*Special References:*

* Gault and Howard — *Outlines of General Psychology*, Chapter IX

Martin — *Psychology*, Part X

* Robinson and Robinson — *Readings in General Psychology*, pp. 351–366 432 - 473

#### *Characteristics of Imagination*

What is the relation between imagination and memory? Can one imagine things not at all related to his personal experience? What is the relation between originality and knowledge? How many classes of imagination do we have? Does imagination carry us beyond personal experience? How? What are some aids to originality? May original thinking become a habit? Is creative thinking relatively free or abundant? Does the creative thinker accept all things at face value? Why does Robinson warn us against the cultivation of originality for its own sake? Why does imagination seem spontaneous? What are some peculiarities of spontaneous creation which throw light on its nature? What are some conditions favorable to productive invention? Discuss briefly the following: (1) Motives in art enjoyment; (2) Appeals in literature; (3) Rôle of empathy in art enjoyment.

Evaluate the following statements:

1. "No creation of genius can be found that does not have a broad ground of real experience behind it." (Breese)
2. "The most fantastic creature of imagination is formed out of the sensory elements of our actual perception." (Breese)
3. "Better to compose with fury and correct with phlegm than to compose with phlegm and correct with fury." (James)
4. "Necessity is not the mother of invention. Knowledge of previous inventions is the mother; original ability is the father." (Thorndike)

### *The Psychology of Play*

Is play instinctive? Is there a single play instinct which motivates all play behavior? What is the probable motive in "kissing games"? In dancing? In what ways is the child's play with his toys similar to the creation of a work of art? What is the relation of exploration and manipulation in child behavior? What are some of the things listed by Woodworth which serve as play stimuli? What are some of the responses? What does Robinson mean by the "compensatory function of make-believe play"? What does empathy mean? Illustrate. What is the rôle of the self-assertive impulse in the motivation of play behavior? What are some other play motives? Economically considered is all play non-productive? Economically speaking is all work productive? Explain the difference between them from the psychological viewpoint. Can human play be explained in terms of instincts? Is there general agreement upon any single point of view?

### *Imagination and Reality in Dreams*

Typically, does a day-dream look to the future, the past, or the present? Is day-dreaming more or less imaginative than most play? What is the most frequent motive force found in day-dreaming? How can the "suffering-hero" day-dream be explained? What is the relation between the thwarting of dominant human urges and day-dreams? Are our day-dreams typically pleasant or unpleasant? Do we have fear day-dreams? How can they be explained? How does the psychopathologist explain worry in abnormal day-dreaming? Can this conception be applied to all worries? How else can it be explained?

Are night-dreams typically more or less frequently pleasant than day-dreams? Why? What are some stimuli for night-dreams? Of what, according to Freud, are dreams symbolic expressions? What is his theory of dreams? Does Woodworth agree with Freud in considering all dreams wish-fulfilling? What are the objections raised by Woodworth to Freud's theory of dreams? Is our behavior influenced by what

we think of ourselves? Illustrate. What is the danger of what Adler calls the "imaginary goals" or "fictitious guiding lines"?

### V. LIST OF CONCEPTS OF TOPIC XI FOR REVIEW

Study the following concepts so thoroughly that you would be prepared to give either instruction or an examination on their meanings as used in connection with the facts of how we think:

Behavioristic conception of thinking; Relation of thinking and talking; Rôle of concepts in everyday behavior; Believing; Judging; Reasoning; Imagining; Controlled thinking; Autistic thinking; Egocentric responses; Relation of reasoning and memory; Inference; Major premise; Minor premise; Syllogism; Aristotle logic; Statistical thinking; Inductive reasoning; Deductive reasoning; Complete act of thought; Dewey's steps of thinking; Empathy; Compensatory function of make-believe play; Freud's conception of dreams; Adler's "fictitious guiding lines."

## Test XI: How We Think

### Part I

Directions. In parentheses on right write the letter to indicate the correct completion.

1. Removal of larnyx destroys (a) articulate speech (b) whispering speech (c) ideation (d) perception (e) sensation. ( )
2. The form of ideation is (a) always known (b) easily detectable (c) always detectable but with difficulty (d) not always detectable. ( )
3. Speech mirrors thought (a) not at all (b) exactly (c) enough for practical purposes (d) very little. ( )
4. The larnyx begins to change structurally in (a) infancy (b) pre-school age (c) college age (d) adolescence ( )
5. Mental set plays a more dominant rôle in (a) rea-

soning (b) reverie (c) dreams (d) rationalization (e) trial and error thinking. (a)

6. Typically in normal persons reverie is of (a) unpleasant nature (b) pleasant nature (c) indifferent (d) mixed. (b)

7. The best indicator of intelligence is (a) the amount of time spent in reasoning (b) what one reasons about (c) number of ideas used. (b)

8. The most frequent motive force found in day-dreaming is (a) sex (b) escape (c) fear (d) self-assertion. (d)

9. Freud explains worry in abnormal day-dreaming as (a) substitute reaction (b) compensation (c) sublimation (d) disguised intention.

10. Woodworth considers worry in day-dreaming as (a) substitute reaction (b) compensation (c) sublimation (d) disguised intention. (a)

11. Kind of thinking stimulated when anyone questions our beliefs and opinions: (a) reasoning (b) imagination (c) trial and error (d) rationalization. (d)

12. All poets and inventors think about (a) what the idea is about (b) form of the idea (c) form of imagery (a)

13. The " detective " use of the free association test is based on the factor of (a) frequency (b) recency (c) intensity (d) satisfaction. (b)

14. The use of the free association test in unearthing a person's emotional " complexes " is based on factor of (a) recency (b) frequency (c) intensity (d) satisfaction. ( )

15. Play can be explained in terms of (a) one instinct of play (b) combination of play instincts (c) play instincts overlaid by habits. ( )

16. The unpleasant, jealous type of love dream is frequently motivated by (a) " suffering hero " mechanism (b) escape (c) fear (d) " conquering hero " mechanism. (a)

## Part II

DIRECTIONS. Before each line in Column B place the number of the best corresponding item in Column A. Place only one number before each of the items in Column B.

| (*Column A*) | (*Column B*) |
|---|---|
| 1. Form of ideation | .....A good stock of knowledge |
| 2. Illustration of reasoning | .....Our desires |
| 3. Illustration of rationalization | .....Is cue to adjustment |
| 4. Illustration of fact that we can't experience complete novelty | .....Imagination |
| | .....Suggestion of solution |
| | .....A person deaf from birth cannot imagine sounds |
| 5. Quality of good reasoner | |
| 6. Distorts perceptions and makes sound thinking more difficult | .....Belief of rural people that large cities are wicked |
| 7. Step of thinking given by Dewey | .....Be a good guesser |
| 8. Inductive reasoning | .....Reasoning |
| 9. Deductive reasoning | .....High sounding statements |
| 10. Descriptive of Watson's conception of thinking | .....A chemist analyzing an unknown |
| 11. Descriptive of meaning or function of concept | .....Talking to ourselves |
| | .....Preconceptions |
| | .....Felt difficulty |
| | .....Day-dreams |
| | .....Is formulated experience |
| | .....A person blind from birth cannot imagine colors and shades |
| | .....Definition and location |
| | .....A doctor making a thorough diagnosis |
| | .....From particulars to universal |
| | .....Night-dreams |
| | .....Verification |
| | .....Anthropomorphism |

(*Column A*) (*Column B*)

.....A critical attitude
.....Memory
.....Militarist proving that war is necessary and beneficial
.....Customary authority
.....Rationalization
.....Conclusion
.....Socialists arguing that all opponents are in league with capitalist
.....Detached meaning provided with a name
.....Used in natural sciences
.....Type of thinking in which insufficient number of cases is most frequent fallacy
.....Is formulating experience
.....Can think without words
.....Used in study of geometry
.....Kind of thinking which begets knowledge
.....Tools of thinking
.....Implicit language habit
.....From universal to particular
.....Makes conduct more adaptable
.....Subvocal talking
.....A system of ideas or intellectual habits

## SECTION VI: INDIVIDUALITY

"Reason," as Thorndike tells us, "finds the aim of human life the improvement and satisfaction of wants." In our efforts to improve and satisfy these wants we frequently behave in rather peculiar ways. The behavior of some individuals is so characterized by "kinks" and "twists" that we refer to them as abnormals. Why do they behave as they do? What are the similarities and differences in the drives and mechanisms of normal and abnormal behavior? Again, individuals differ in intellect, in temperament, in skill, and in morality. Furthermore, any given individual possesses varying amounts of different traits. An individual may rate high in intellectual development and relatively low in emotional development. That is, we find individual differences in every trait and trait differences in every individual. What is the nature of these differences? What are the contributing factors, if not the causes, for these differences? An intelligent consideration of these questions necessitates the study of two recent developments in psychology which are to a large degree responsible for the present widespread interest in the science. These are (1) the mental testing movement whose contributions have thrown much light on the nature and significance of the mental level of individuals; and (2) development in psychopathology, including psychoanalysis, whose contributions have thrown light on the nature and significance of mental functions of individuals.

This study of the nature and causes of individual differences, especially as revealed by the measurement of human traits, will be treated in Topic XII, called "The Abilities of Man — Their Nature and Measurement." In Topic XIII we shall attempt to integrate and apply our knowledge of the facts of human nature. In our study thus far we have considered separately such subjects as man's native behavior, his acquired modes of behavior, his ways of perceiving, and his modes of thinking. With

this analyzed knowledge of man as a background we are now prepared to integrate our knowledge and study man as an "assembled organic machine," and more — an *integrated* personality.

## Topic XII: The Abilities of Man — Their Nature and Measurement

The test of mental efficiency for most of us is not the ability to meditate on the highest ideals but to see and think clearly about the problems of everyday life. The Nineteenth Century Humanitarianism with its philosophy of equality failed because it was not cognizant of this important fact. Abilities, desires, and preferences cannot be standardized and made to order at a moment's notice. Intelligent discussion of such problems as equalization of educational or social opportunity should be based on a knowledge of the nature of human abilities — their distribution, their growth, their organization, and their desires and satisfaction. In the last quarter of a century psychology has made progress in the measurement of human abilities. Perhaps the most progress has been made in that phase which has attracted a great deal of popular interest, namely, intelligence testing or the measuring of "general ability." The opposition to these tests is based to some extent on a misunderstanding or lack of understanding of them. There is nothing in the tests that justifies the strong in exploiting the weak. Another source of opposition comes from those who are particularly concerned with the proposition that if intelligence is biologically inherited and if acquired characteristics cannot be biologically transmitted, there appears theoretically to be a limit to the amount and rate of social improvement. But if general intelligence is the effect of a favorable environment only, then the limit to the development of man is practically removed, and the ills of society can be corrected through education and the accumulated social heritages. The position which one must take at present should be decided after a study of the abilities of man, their measurement, and their nature has been made. The larger part of this lesson will be devoted to a discussion of the way the psychologist, as a scien-

tist, goes about constructing the tests, of the claims he makes for them, of the limitations of the tests, of their significance, and of their uses and their abuses. Also there will be included in this topic a brief survey of the attempts psychology is making to measure special abilities and other personality traits which cannot be predicted reliably on the basis of intelligence tests and which are really significant in an individual. The whole topic, then, deals with the accomplishments and efforts of the psychologist to do what employers, educators, and parents have always done ineffectively, to "size up" an individual. A more thorough treatment of the nature of ability and intelligence can be found in such books as Thorndike's *Measurement of Intelligence,* Spearman's *The Abilities of Man — Their Nature and Measurement,* and his *Nature of Intelligence.* But for easier reading the student is advised to read first the books listed for further study. The applied aspects of testing are usually found in books or courses dealing with their respective fields, such as educational measurement, employment psychology, tests in business, clinical psychology, and the like.

*General References:*

GATES — *Elementary Psychology,* Chaps. XV and XVII (Chaps. XVII, XVIII, and XIX)
CARR — *Psychology,* Chap. XVII
WOODWORTH — *Psychology,* Chap. II (Chap. XII)

*For further study:*

THORNDIKE — *Individuality*
PINTNER — *Intelligence Testing*
THOMSON — *Instinct, Intelligence and Character,* Chaps. XVII to XXII
FREEMAN — *Mental Tests*
TERMAN — *Measurement of Intelligence*
DASHIELL — *Fundamentals of Objective Psychology,* Chap. XI
ELLIS — *The Psychology of Individual Differences*
HULL — *Aptitude Testing*

## I. THE NATURE OF ABILITY

*Special References:*

* HAZLITT — *Ability,* Chaps. I, II, III, and IV
ROBINSON AND ROBINSON — *Readings in General Psychology,* pp. 597–601; 578–580
PINTNER — *Intelligence Testing,* pp. 52–71
* PERRIN AND KLEIN — *Psychology,* pp. 313–324; 339–360

### *Intelligence and Ability*

Can intelligence be demonstrated except in connection with some particular ability? Is intelligence a single unitary power? Is there such a thing as "pure intelligence"? Is instinctive behavior opposed to intelligent behavior? Broadly speaking, what is intelligent behavior and how is it demonstrated? In what sense are intelligence and ability synonymous? Is the person who is clever in one activity likely to be clever in another? Generally, is there correlation or compensation of abilities? Is there a general factor or group of factors in ability? May a person be a "genius" in a special field of work and yet be incapable of looking after his own affairs? What are the five abilities that Dr. Burt considers of most importance? Is general intelligence native or acquired? Are special aptitudes native or acquired? What evidence do you have for your answer? What does Hazlitt mean by "the dependence of intelligence upon confluence"? Illustrate on: sensory level; perceptual level; conceptual level. Evaluate the following statements concerning the meaning of intelligence or the nature of ability:

"Comprehension, invention, direction, censorship; intelligence lies in these four words." (Binet)

"An individual is intelligent in proportion as he is able to carry on abstract thinking." (Terman)

"Intelligence is the power of good responses from the point of view of truth or fact." (Thorndike)

"General intelligence is the ability of the organism to adjust itself adequately to new situations." (Stern)

"Intelligence seems to be a biological mechanism by which the effects of a complexity of stimuli are brought together and given a somewhat unified effect in behavior." (Peterson)

"If there is anything general it is a capacity; all abilities are special." (Hazlitt)

"An individual possesses intelligence in so far as he has learned, or can learn to adjust himself to his environment." (Colvin)

"Intelligence is conscious, biological response to stimulus, resulting in environmental readjustment." (Herring)

What are the important theories of mental organization? Which implies that there is one kind of intelligence? Which implies that there are several kinds? Which maintains that mental abilities are not related? What psychologists advocate each? What is the evidence which bears on theories of mind and what does it show? Which — the intelligent or unintelligent organism — has a multiplicity of response? Which few? Which makes for more "activity leading to further activity"? Which is narrow and restricted? What is the connection between this fact and the ability to learn? What are the two intellectual factors which Woodworth considers constituents of intelligent behavior? What other trait does he say intelligence includes? What does Pintner mean by an empirical concept of intelligence? What are the practical advantages of this point of view?

### *Growth of Intelligence*

Ability to do implies something to do it with. There is then a positive correlation between cerebral anatomy and intelligence. Does this imply that every man with a larger brain is always mentally superior to the man with the smaller brain? Do all idiots have small brains? Are all men with extremely small brains idiots? What other factors besides weight of brain must be considered? Has an intelligence center in the brain been localized? Have instinct centers been localized? What have been localized?

At the age of twelve in man the brain has obtained practically its full weight. Does that necessarily imply that intelligence stops growing at that age? When do most changes in mental development take place, in earlier or later years? Is there an equal increment every year? If so what shape would the curve for the growth of intelligence have? If the incre-

ments each year are not equal but decrease with increase of years what shape does the curve take? What age does Terman take as the upper limit of the average growth of intelligence? At about what age does the evidence to date indicate that the limit is reached? Does this mean that we cannot learn any more after that age? What does it mean? Are the instruments of measurements fine and valid enough to measure adequately the higher levels? Does this fact throw any light on the question of limits of intelligence? What then is the common sense viewpoint on this question?

### *Distribution of Human Abilities*

Do all humans have instincts, emotions, and capacities to learn to perceive, to remember, to imagine and to infer? Are there then different kinds of individuals? Does this mean that all individuals are equal quantitatively? Do individuals differ greatly in physical traits? Mental traits? If enough individuals are measured on any given trait in what manner do their attainments distribute themselves? Do results of measurement show that variations among people of similar circumstances are wide or narrow? Are the variations continuous or are they characterized by definite steps or gaps? Do the measures cluster around a central point or do they scatter in a way best described as being multi-modal? How may the distribution of abilities be shown graphically? What is a frequency polygon? A frequency curve? What is the shape of the normal probability curve? From the point of view of science does chance mean a happening without a cause? What does it mean? What are three important properties of the normal distribution curve? How may it be applied in grading? What do the results of intelligence tests show about the number of idiots in society? Imbeciles? Geniuses? What group is in the majority? The number of geniuses is comparable to that of what other group? What are some educational implications of these facts? Social implications?

### *Causes of Individual Differences*

How can the fact that human traits tend to distribute themselves normally be explained? What are some causal factors?

What is the rôle of heredity? Is environment a causal factor? Is sex a causal factor? Are sex differences in traits larger or smaller than commonly assumed? What, in brief, are the facts concerning intellectual differences of the sexes? How can the facts be explained? What sex differences are found in emotional and temperamental traits? How can these be explained? Is race a causal factor of individual differences? Do the facts of psychology warrant the assumption of a general racial superiority? What, in brief, do the test results of racial groups in America seem to show concerning racial differences? Why do two brothers frequently differ in capacity to learn? Is maturation a causal factor of individual differences? How can the influences of nativity be studied?

## II. MENTAL TESTS AND MEASUREMENTS

### *The Measurement of Intelligence*

*Special References:*

* Perrin and Klein — *Psychology,* pp. 324–339
* Gates — *Elementary Psychology,* pp. 453–462; 480–489 (523–536; 554–571)
* Woodworth — *Psychology,* Chap. II (pp. 272–277)
Robinson and Robinson — *Readings in General Psychology,* pp. 607–626

Did Binet conceive of intelligence as a single quality or a complex of abilities? How did this change his method of attack upon the problems of measurement? How did Binet go about constructing his tests? What was he trying to do? What English scientist usually is accredited as the pioneer in the field? What American psychologists were pioneers in the field? Who are some outstanding workers today? Does an intelligence test measure all aspects of mental maturity? What does it measure? What determines the value of a mental test?

What is the most known individual test? How was it standardized in America? By whom? Which is the more important fact to be known, that a child can draw a circle or can draw it at a given age? Who saw the advantage of knowing this fact in a

more practical way? What other method of standardization is used? What is mental age? How is it obtained? What is an intelligence quotient? How is it determined? Brightness and dullness can be reported in what way? Which, the M.A. or I.Q., describes the rate of mental growth? Which indicates the greater intelligence at any given time? Which is the relative measure? Which is the absolute measure? What range of I.Q.'s is considered as indicative of normality? Of feeble-mindedness? Of mental superiority? Of genius? If a child has a high I.Q. at seven, will he have it at seventeen? Does the I.Q. change with age? Is it relatively constant? What evidence do you have for your answer? Besides the Stanford-Binet name three other individual tests. What are their special advantages and disadvantages? What are some limitations of verbal tests? Do they always satisfy a basic consideration in the selection of tests, common experience and interests of individuals tested? Can illiterates be tested by verbal tests? The deaf? The blind? What kind of tests should be used for testing illiterates, foreigners, and other handicapped in verbal tests? What is the best known of such scales?

Individual tests, both verbal and performance, are expensive. For classification purposes what more economical instrument is used? What tests were used in the army? What kind of a test was used for measuring foreigners and illiterates? What are some limitations of group tests?

*The Measurement of Special Abilities and Personality Traits*

What are tapping tests? Tracing Tests? Steadiness tests? Aiming tests? How is muscular strength measured? Muscular fatigue? Name five other tests of physical and motor capacity? What are some uses of tests of physical and motor capacity?

What are special aptitude tests? What is their advantage over intelligence tests? Briefly describe a well-known musical talent test. A mechanical aptitude test.

Can emotional make-up be so determined? Persistence? Temperamental traits? What are some tests or rating scales used to supplement intelligence tests? Briefly describe the

Pressey X–O test. The Downey Will-Temperament test. The Voelker tests. Is intelligence the only quality necessary for successful living? Intelligence and special abilities? Name five other desirable human traits necessary to get on well in life. Can these be predicted from scores made in intelligence tests?

### *The Mathematics of Measurement*

What are measures of central tendency? What do they not tell about a distribution? What other kind of measure is necessary to interpret intelligently the nature of a distribution? What is a median? Mode? Mid-score? What are some common measures of variability? What is meant by a measure of concomitant relationship? What is a coefficient of correlation? What is a positive correlation? A negative correlation? A high correlation? Does correlation mean causation? Does it mean association? If so, what kind of association? To discuss intelligently the results of mental testing what other concepts from statistics can you explain?

### III. THE SIGNIFICANCE OF TESTS — SOME USES AND ABUSES

*Special References:*

* GATES — *Elementary Psychology,* pp. 465–479 (536–550)
* WOODWORTH — *Psychology,* Chap. II (pp. 283–288)
MARTIN — *Psychology,* Part XII

What do measurements of groups of representative children show about the distribution of intelligence? About what per cent have an I.Q. below 70? 70–80? 80–90? 90–100? 100–110? 110–120? 120–130? Over 130? Generally speaking, what is the relation between intelligence and scholastic achievement? What are persons with I.Q.'s of 20 or below usually called? Individuals with I.Q.'s ranging from 20–50? 50–70 I.Q.? 70–90 I.Q.? 90–110 I.Q.? What scholastic attainment may be expected from an individual in each of these levels? Ability to read, spell, or do simple arithmetic generally requires a minimum I.Q. of what? Genuine comprehension in reading or arithmetic generally calls for a minimum of what I.Q.? What is the minimum I.Q. essential for appreciable

achievement in grade school work? In high school work? In college work? Burt reports high correlations between intelligence and such subjects as composition or reading and low correlations between intelligence scores and such subjects as drawing and handwork. How can these correlations be explained? Generally, who makes a higher score on intelligence test, college students who major in mathematics, natural sciences, social sciences, pharmacy, dentistry, or commerce? Why? Can vocational success be predicted from intelligence? With what degree of certainty? Can probable failure or success in a given vocation be the more reliably predicted? Why? Is there a positive correlation between leadership and intelligence? Is the correlation perfect? Why not? Is there any relation between intelligence and feeble-mindedness? Are all feeble-minded delinquent? Are all delinquents feeble-minded? What per cent have been found to be average? Above average? For clinical purposes is a knowledge of the intelligence of an individual sufficient? Is it possible to have a high mental level and yet have poor mental function? How is mental function determined?

Comment on the following statements concerning the effects of mental testing:

"Intelligence testing is resulting in the formation of intellectual cleavages, the worst form in a democracy." (Bagley)

"It may be of greater value to society to discover a single gifted child and aid in his proper development than to train a thousand dullards to the limit of their educability." (Terman)

"Morality is more susceptible than intellect to environmental influence." (Thorndike)

"Civilization made it possible for the weaklings to survive. Eventually it tended to destroy leadership. We transferred authority to the weak and unintelligent and called the deal democracy." (Wiggam)

"The amount of intellectual capacity needed for moderate success under our present-day civilization is comparatively small and that little made practically effective by proper education and training; but the emotional adaptation demanded by our ever-increasing, complicated environment is considerable; and our instinctive cravings upon which it depends, unlike our intellectual capacities, are not only hard to mould, but difficult to find sub-

stitute outlets for. In a certain sense, then, the need for measuring the emotional capacity of an individual would seem more urgent than ascertaining his intellectual capacities." (Wechsler)

" It is rhapsodical to give survival value to mediocrity and have survivors who are not mediocre." (Ireland)

" The honest but incompetent official is the curse of Governments." (Ireland)

" A pasteurized, sanitized society is not necessarily progressive or dynamic." (Todd)

" Human mentality cannot be improved by breeding with the ease with which we can change short peas into tall, curly-haired guinea pigs to sleek, or plain blossoms to mottled ones." (*T. C. Record*)

" Democracy aimed not at making good citizens but at making a mass of amateur executives." (Lippman, *The Phantom Public*)

" Education is more a differentiating than a levelling process." (McDougall)

" In a democratic age, intellectual distinction among men is undervalued, since such distinction is not flattering to the many. Hence intellectual differences become relatively unimportant. But differences in the matter of conformity to moral convention are overrated. The mediocre is as good as the rest. Superiority is not congenital but ' acquired ' — Hence one goes in for morality as a protest against the feeling of inferiority." (Martin)

" There is no such thing as a bad boy. Either he does not know any better or else he cannot help it." (Mateer)

" No ' advanced educator ' can allow himself to be so absorbed in the question of what a child ought to be as to exclude the discovery of what he is." (Jane Addams in *Democracy and Social Ethics*)

" The conservation of intelligence is of the utmost importance. Mind may be undeveloped, wasted, futilely employed." (Weeks in *The Control of the Social Mind*)

### IV. LIST OF CONCEPTS IN TOPIC XII FOR REVIEW

Study the following to be thoroughly prepared for a five-minute quiz or examination upon one topic to be selected at random by your instructor.

Nature of ability; General intelligence; Special abilities; Theories of mental organization; Empirical concept of intelligence; Relation of cerebral anatomy and intelligence; Idiots;

Imbeciles; Morons; Normals; Genius; Growth of intelligence; Distribution of human abilities; Correlation of traits; Causes of individual differences; Sex differences; Racial differences; Intelligence quotient; Mental age; Performance tests; Tests of personality traits; Measures of central tendency; Measures of variability; Coefficient of correlation; Median; Mode; Standard deviation; Relation of intelligence and delinquency; Educational uses of mental tests; Vocational uses of mental tests.

## Test XII: The Abilities of Man — Their Nature and Measurement

### Part I

Directions. Below is a paragraph from which important words have been omitted. These omissions are indicated by the numbers in the parentheses. From the list of numbered responses below select the correct response in each instance. Write the numbers of responses so selected in appropriate parentheses at the right of the page.

If people were all cast in the same mold, there would be no need of tests or other selective devices; knowing one we should know all. But individuals (1) in every trait, (2) or (3), ever measured. Results of measurement show that variations among individuals are (4); that variations are (5) and that individuals are (6) around a (7) ability rather than at (8). This indicates that differences are not (9). That is, all individuals are equal in the sense that they all have the same (10), (11), and (12). But (13) no two individuals are alike. The difference, then, is not of (14) but of (15). That is, the genius does not possess (16) capacities than the normal. He possesses more of the same (17). Similarly the normal individual differs from the feeble-minded in that he possesses more of the same (18). Normality, then, is a matter of (19). It is a (20) concept. It is the realization of the educational implications of individual differences which is responsible for such tendencies in education as (21) and (22).

1. ( 7 )
2. ( 7 )
3. ( 1 )
4. ( 4 )
5. ( 9 )
6. ( 3 )
7. ( 10 )
8. ( 4 )
9. ( 11 )
10. ( 12 )
11. ( 13 )
12. ( 14 )
13. ( 15 )
14. ( 13 )
15. ( 19 )
16. ( 20 )
17. ( 14 )
18. ( 14 )
19. ( 19 )
20. ( 1 )
21. ( )
22. ( c )

1. mental
2. wide
3. clustered
4. extremes
5. individualized instruction
6. classification on basis of ability
7. differ
8. physical
9. continuous
10. central
11. qualitative
12. instincts
13. kind
14. capacities
15. functional

16. qualitatively
17. emotions
18. quantitatively
19. degree
20. different
21. quantitative
22. Socialized recitation
23. romantic
24. narrow
25. structural

## Part II

DIRECTIONS. Before each item in Column B write the number of the best corresponding item in Column A. Write only one number before each of the items in Column B.

| (*Column A*) | (*Column B*) |
|---|---|
| 1. Factors of intelligence as analyzed by Woodworth | .....Invention |
| 2. Theory of mental organization which implies there is one kind of intelligence | .....Retentiveness |
| 3. Implies several kinds of abilities | .....Stenquist |
| 4. Implies no interrelation of abilities | .....Uni-modal |
| 5. Test of personality traits | .....Downey Will-Temperament |
| 6. Constructed mechanical aptitude test | .....Seashore |
| 7. Constructed musical aptitude test | .....M.A. of 7 |
| 8. Measure of central tendency | .....Voelker tests |
| 9. Measure of variability | .....Mode |
| 10. Measure of relationship | .....Persistence |
| 11. Taken as indication of idiocy | .....Mid-score |
| 12. Indication of imbecility | .....Multi-modal |
| 13. I.Q. below which indicates feeble-mindedness | .....Median |
| 14. Normal level | .....Pressey X-O |
| 15. Genius | .....Responsiveness |
| 16. Included in Binet's conception of intelligence | .....Average deviation |
| 17. Moron level | .....Non-modal |
| | .....Arithmetic mean |
| | .....M.A. up to 2 |
| | .....Standard Deviation |
| | .....Foot Rule |
| | .....R. |
| | .....20 I.Q. |
| | .....M.A. 3, C.A. 7 |
| | .....M.A. 6, C.A. 9 |
| | .....100 I.Q. |
| | .....15–20–I.Q. |
| | .....70 I.Q. |
| | .....Direction |
| | .....I.Q. 140 up |
| | .....Censorship |
| | .....Q |
| | .....Comprehension |

## Topic XIII: Personality

Personality to the modern psychologists is not a mysterious "It" which some individuals possess and others entirely lack. The ancients explained personality in terms of four great "humors" or fluids of the body. The individual with a surplus of blood was "sanguine." The "choleric" had a surplus of bile. A surplus of black bile or spleen made an individual "melancholic." The surplus of phlegm made one phlegmatic. Today we laugh at this analysis of man's temperament. We know it was based on a false physiology. On the basis of a few known characteristics individuals cannot be grooved into absolute "Personality Types." The list of human traits is long. The factors that influence their development and integration are many. The nature of personality is complex. Our present knowledge of it is the result of contributions made by many workers from many fields. Especially important are the contributions of endocrinologists, psychoanalysts, psychiatrists and behaviorists. A thorough consideration of all that is known leads into a study of materials covered in such courses as Abnormal Psychology or Mental Adjustments.

In this lesson we will attempt to do no more than cover problems such as the following: What traits does personality include? How are these traits developed? To what extent are they changeable? What are the essential differences between integrated and disintegrated personalities? What is the rôle of thwarted desires in the formation of disintegrated personalities? What are some of the causes and effects of disintegration? What light do these facts throw on the peculiarities in human behavior? How can these facts be applied in problems of mental adjustment?

*General References:*

Watson — *Behaviorism,* Chap. XII

Woodworth — *Psychology,* Chap. XIII (Chaps. XX and XXI)

Gates — *Elementary Psychology,* Chaps. IX *and* XVI (Chap. IX)

*For Further Study:*

HART — *Psychology of Insanity*
FREUD — *Psychopathology of Everyday Life*
WELLS — *Mental Adjustments*
PRESSEY — *Mental Abnormality and Deficiency*
MORGAN — *The Psychology of the Unadjusted School Child*
TAYLOR — *Readings in Abnormal Psychology and Mental Hygiene*
PRINCE — *Clinical and Experimental Studies of Personality*
BAGBY — *The Psychology of Personality*
WHITE — *Outline of Psychiatry*
DASHIELL — *Fundamentals of Objective Psychology*, Chap. XVIII

### I. THE NATURE OF PERSONALITY

*Special Reference:*

* PERRIN AND KLEIN — *Psychology*, pp. 360–375

What does a "dominating personality" dominate? A "charming personality" charms what? A "submissive personality" submits to what? Such traits as assertiveness, submissiveness, pride, inferiority, are dependent on what? Refinement, tact, morality, are dependent upon what? All personality traits, then, have what in common? Are all reflexes traits? When are they so classified? Do your answers to the foregoing questions prove or disprove Allport's statement to the effect that personality is largely a social fact? Does personality include intellect? Physical make-up? Emotional make-up? Character and temperament? Explain and evaluate the following statements concerning personality:

1. Personality is the individual considered as a behaving entity.
2. Personality is the series of effects produced by a given individual upon others.
3. "Personality is a complex affair in that in its make-up there enter many factors, some acquired and some innate." (Prince)
4. "Personality is the total outcome of an individual's mental organization comprising all his permanent mental conditions and organized experiences at any period of life." (Warren)

Who views personality from the standpoint of repression, conflicts, sublimation, and other mental mechanisms? Who

explains personality traits in terms of endocrinal activities? Who sees it as the end product of our habit systems? How can impulsive behavior be distinguished from voluntary behavior? From involuntary? Which better represents the total personality? What are the established facts about personality types? Are red-haired people quick-tempered? Are brunettes emotional? Is a convex face an indication of an abundance of mental energy? Can individuals be divided into two types — introverts and extroverts? In imagery types? Variations in the measurement of single traits center around how many types? This is called what? What are the known facts about the distribution of human traits?

## II. THE ANALYSIS OF PERSONALITY

*Special Reference:*

* BURNHAM — *The Normal Mind,* pp. 46–58

### *"Selves" and "Habit Systems" in the Development of Personality*

Does the very young infant distinguish between persons and things? Between his own and other personalities? Why does a young child frequently talk in the third person of himself? What does the sense of "me and mine" include? Does it include what you think of yourself? What you say you think of yourself? What you know about yourself? What you wish and plan for yourself? How many selves have we? What does Burnham mean by the child self? The social self? The conventional self? The educated self? The business self? The reputation complex self? The total self? Into what does Watson analyze personality? What is the connection between Watson's habit systems and Burnham's description of our many selves? What does Watson mean by the "stream of activity"? What are the advantages of the behavioristic approach to the study of personality? What are its limitations?

### *Integrated and Disintegrated Personalities*

Is it possible for the same individual to be submissive in certain situations and assertive in others? To be a cruel hus-

band and a fine boss? To be highly religious in formal ways and intellectually dishonest? How can you explain this in terms of "selves" or "habit systems"? What determines which habit system dominates? Illustrate. In an integrated personality the habit system released is characteristic in what way? What is the rôle of attention in mental adjustments? What are individuals whose attention and field of activity is extremely diffused called? Individuals whose attention or field of activity is narrowed are usually classified as what? Can an individual be normal in one aspect of life and abnormal in another? Are most of us perfectly integrated? What is meant by dissociation of personality? What are some distinguishing characteristics of dissociation in dementia praecox cases? Manic depressives? Hysteria? Is normality then a structural or functional concept?

### III. MECHANISMS IN MENTAL ADJUSTMENT

*Special Reference:*

* MARTIN — *Psychology,* Part XI

Do we always act out our impulses? Why or why not? What are the sources of inhibition of our native or acquired urges? What is meant by a "conflict of selves" or a "mental conflict"? According to Freud what urge plays the most important rôle in mental adjustment? It may conflict with what? According to Freud what happens to "suppressed desires"? How does Freud explain much of our nervousness, fears, forgetfulness, pains, stuttering? What, in brief, is Freud's conception of mental conflict — its causes and effect? Are the Freudian concepts scientifically sound? How do Woodworth and Gates consider the "unconscious mind"? What happens when a strong impulse is thwarted? What relation does Gates see between these reactions and "trial and error" learning? How does Watson explain Freud's "unconscious"? How may an inferiority lead to a compensation? Does the form of compensation always lead to more satisfactory adjustment? What are some illustrations of inferiority feelings leading to an escape from reality?

Briefly discuss the following personality disturbances as considered by Watson: (1) Our susceptibility to flattery; (2) Infant carry-overs; (3) Our constant strife to become kings and queens. The mechanism in "conquering hero" form of introversion in extreme form resembles what form of insanity? What does the "suffering hero" type in extreme form resemble? Illustrate the following forms of rationalization as treated in Gates: Projection; Sour-grapes mechanism; Logic-tight compartments; What are defense mechanisms? Escape mechanisms? What do psychoanalysts mean by "resistance"? "Sublimation"? "Transference"? "Compulsion Neurosis"?

### IV. PROBLEMS OF MENTAL ADJUSTMENT AND HYGIENE

*Special Reference:*

* BURNHAM — *The Normal Mind,* Chap. XX

Does an understanding of the foregoing mental mechanisms throw any light on the peculiarities of human behavior? How? Does it throw any light on the reliability of much that has been written in sociology and philosophy? How? Explain the following:

1. Why one often leaves an umbrella at home of friend where he wishes to return?
2. Why, if we like painting, we assume it to be the finest form of art?
3. Why do many men "want a little girl just like the little girl who married Pa"?
4. Ceremonials as ends in themselves.
5. Possible mental mechanism in the use of such words as demagogue, grind, and bookworm.
6. Why so many people love to read about scandal?
7. Form of rationalization used by students for explaining failure on examination.
8. Why lower animals show sign of internal conflict.
9. Atheism of a man whose fiancee eloped with the most enthusiastic of his fellow Sunday-school teachers.
10. Excusing immorality of lying in business on grounds that it is necessary to live and to support one's wife and family.

What does Martin have to say about the need of conscious social control?

According to Dr. Cabot, what proportion of a general practitioner's ordinary work is concerned with types of psychoneurosis? What are some of the "cures" tested by Gates? Did these cures call for diagnosis before treatment? How can you explain the success of some? A real cure calls for what? What are the five requirements given by Dr. Franz as principles of guidance in reëducation? Comment on the following statements:

1. "Incompetence is sometimes the result of too few interests." (Robinson)
2. "Give your decision, it will probably be right. But do not give your reasons, they will almost certainly be wrong." (Anon.)
3. "It is possible that insanity, or a part of insanity, will prove to be less dependent upon intrinsic defects of the individual than on the conditions in which he has to live, and the future may determine that it is not the individual who must be eliminated, but the conditions which must be modified." (Hart)
4. "The man who never exposes himself to such stimuli (friends, teachers, theaters, movies) will never change his personality for a better one." (Watson)
5. "The hell to be endured hereafter, of which theology tells, is no worse than the hell we make for ourselves in this world by habitually fashioning our characters in the wrong way." (William James)
6. "Shun the New England conscience." (Riggs)
7. Man is found in *Sehnsucht*, his yearnings rather than accomplished ends. (Hocking)
8. "Conscious life is engaged in trying to find out what it wants as in trying to get it." (Thorndike)
9. Ethics is purely a matter of practical and social adjustment. (Martin)
10. The aim of mental hygiene is prevention rather than cure. (Burnham)

### V. LISTS OF CONCEPTS IN TOPIC XIII FOR REVIEW

Personality traits; Repression; Mental conflict; Sublimation; Voluntary behavior; Involuntary behavior; Total personality; Main personality; Dissociation; Integrated per-

sonality; Disintegrated personality; Behavioristic approach to study of personality; Psychoanalysis; Stream of activity; Expansion of self; Freud's conception of "unconscious"; Thwarted urges; Psychology of compensation; Inferiority feelings; Transference; Mechanisms of introversion; Psychasthenia; Psycho-neurosis; Mental hygiene.

## Test XIII: Personality

### Part I

Directions. In the parentheses at the right, write the proper letter to designate the best answer as required.

1. The integration of personality may be taken as the essential characteristic of the normal mind for persons (a) of superior intelligence; (b) of inferior intelligence; (c) of average intelligence; (d) of all levels of intelligence. 1. ( )

2. The habit system that is released at any one given time is determined by the (a) response; (b) connection; (c) situation. 2. ( )

3. Individuals whose attention and field of activity are extremely diffused are said to have (a) psychasthenia; (b) hysteria; (c) insanity; (d) dementia praecox. 3. ( )

4. Individuals whose attention and field of activity are extremely narrowed are said to have (a) psychasthenia; (b) hysteria; (c) insanity; (d) dementia praecox. 4. ( )

5. That one aspect of behavior which singly is most characteristic of total personality is (a) impulsive behavior; (b) voluntary behavior; (c) involuntary behavior; (d) native behavior; (e) acquired behavior. 5. ( )

6. The earliest age after which most persons' personalities do not materially change is (a) 40; (b) 30; (c) 24; (d) 16; (e) 20. 6. ( )

For elements 7 to 12 inclusive select the answers from the following: (a) Jung; (b) Freud; (c) Gates; (d) Adler; (e) Woodworth; (f) Watson; (g) Janet; (h) Prince; (i) Wells; (j) Franz.

7. The originator of psychoanalysis is 7. ( )

8. The psychoanalyst who stresses extroverts and introverts as psychological types is 8. ( )

9. An authority on dissociation who has written a book on the subject is 9. ( )

10. An authority who stresses the factor of organic inferiority in abnormal behavior is 10. ( )

11. An authority on nervous and mental re-education is 11. ( )

12. A psychoanalyst who stresses the factor of mental insufficiency in abnormal behavior is 12. ( )

(The answers for elements 13 to 24 inclusive are to be selected from the list of terms which follows the paragraph.)

Individuals differ in their ability to adapt desire and satisfaction. There are no types of individuals, such as integrated and disintegrated. The difference is one of (13), not (14). Normality, then, is a (15) and not a (16) concept. Individuals on one extreme, who are easily upset, very sensitive to difficulties in adjustment and consequently susceptible to nervous and mental disorders are called (17) or (18). They are extremely (19). On the opposite extreme is the very practical-minded person who is called an (20). The "conquering hero" form of introversion in the extreme resembles the (21) found in (22). The "suffering hero" type of introversion in the extreme resembles (23) found in some (24).

13. ( )
14. ( )
15. ( )
16. ( )
17. ( )
18. ( )
19. ( )
20. ( )
21. ( )
22. ( )
23. ( )
24. ( )

List:

1. Kind
2. Neurotic
3. Delusions of grandeur
4. Functional
5. Introverted
6. Paranoia
7. Degree
8. Psychopathic
9. Insane
10. Structural
11. Extrovert
12. Delusions of persecution

## Part II

DIRECTIONS. Before each line in Column B write the number of the best corresponding item in Column A. Place only one number before each item in Column B.

| (*Column A*) | (*Column B*) |
|---|---|
| 1. Explains personality in terms of repression, conflict, sublimation, etc. | .....Watson |
| 2. Sees personality as end product of habit system. | .....Social taboo |
| 3. Explains personality in terms of activity of endocrine glands. | .....Freud |
| 4. Possible cause of inferiority feeling. | .....Dementia praecox |
| 5. Possible source of inhibition of dominant urge or desire. | .....Inability to rise to level of family aspirations |
| 6. Illustration of "sour-grape" forms of introversion. | .....Slips of speech |
| 7. Illustration of projection. | .....Antagonistic urge |
| 8. What Freud thinks our unconscious wishes motivate. | .....Excusing careless behavior by calling it "Lord's Will" |
| 9. Why a young child frequently talks of self in third person. | .....Sullenness |
| 10. Behavior explainable as "suffering hero" type of introversion. | .....Jung |
| 11. Illustration of form or condition of disintegration of personality. | .....Antagonistic habit system |
| | .....Psychasthenia |
| | .....Dreams |
| | .....Berman |
| | .....Too easy early success giving false security |
| | .....Consider loss of job as blessing in disguise |
| | .....Adler |
| | .....Calling examination failed on unfair |
| | .....Obstacles in environment |
| | .....Psychoanalysts |
| | .....Calling pretty people stupid when you don't know their intelligence |
| | .....Child's refusals to eat |
| | .....Janet |
| | .....Shell shock cases |

(*Column B*)

. . . . . Undue intense drive toward unattainable goal
. . . . . Wit and humor and its reception
. . . . . Behaviorists
. . . . . Drunkard blaming alcoholism on heredity
. . . . . Prince
. . . . . Unfavorable comparison
. . . . . Dissociation
. . . . . Does not distinguish between self and other selves
. . . . . Child's refusal to play
. . . . . Franz
. . . . . Mental conflict
. . . . . Pretended injuries of child
. . . . . Hysteria
. . . . . Manic depressive form of insanity

# APPENDIX

# ANSWERS TO TESTS WITH TENTATIVE NORMS

## Notes Concerning the Answers and Norms

This section offers you the answers to the tests which have been provided to assist you to check the effectiveness of your daily study. To take a test and to study the facts concerning the elements which you have answered wrongly is itself an effective method of study. But the use of these answers should not be abused. To use them as casual reference to save yourself study or to "cheat" yourself by using them otherwise than for verifying your own work after you have completed your study keeps you from gaining the benefit which otherwise you might obtain from their proper use. Restraint from temptation to consult them improperly will, if practiced here and elsewhere, contribute to development of intellectual honesty and self-respect.

The use of the answers themselves should be fairly obvious; but a brief statement should be made about the norms. The value of these, as tentative norms only, is in part dependent upon the number of cases upon which they have been based. This number generally is stated. Variations from expected scores will occur because of special emphasis or the method used as well as the general abilities and attitudes of the students. Scores for which norms are offered are the arithmetic sums of the scores earned in the two or more parts of each test. The figures include the highest possible total score, the number of cases upon which the norms have been based, the range of actual scores showing the highest and lowest actual scores, the median, the 25th percentile, and the 75th percentile. By median there is meant that score which separates the higher half of the class from the lower half; by $Q_1$ or the 25th percentile there is meant that score which separates the lowest one-fourth of the class from the highest three-fourths; and by

$Q_3$ or the 75th percentile, there is meant that point or score which marks off the highest one-fourth of the class from the lowest three-fourths. A statement of the average deviation or mean variation is included.

For those colleges which use a six-letter system of grades there is appended a table of equivalent letter grades and scores values. Variation from the letter values as indicated may be required in special classes or schools. They are included, however, because of their interest and because of their value as a general standard by means of which work of other classes can be compared. As has been stated these norms are tentative, and they will be modified as necessary in the light of their further use. Receipt of frequency distributions of scores on these tests, together with a general statement of the uses made of *Developed Lessons* and of the tests will be appreciated by the authors.

For convenient interpretation of scores and their grade equivalents norms for all tests are presented in tabulated form on pages 192–193. These may be of special use for comparing relative standings in two or more of the tests or for diagnostic study.

On the chart for test grades (page 191) the student should plot and graph the result of his respective test scores. These should be plotted in terms of the letter ratings so that they will be comparable. Interpolation within these letter grades will make the work more exact and the course of the curve more nearly represent actual progress.

## Test I — Scope and Methods of Psychology

ANSWERS

| Part I | Part II |
|---|---|
| | *First Half* |
| + 1. | 3 Rests, authorized and unauthorized |
| + 2. | 8 Testing |
| | 1 Physiognomy |
| — 3. | 3 Overcoming of distractions |
| + 4. | 6 Reflexes |
| — 5. | 6 Determination of the influence of |
| + 6. | anger on mental activity |

| Part I | Part II |
|---|---|
| — 7. | 1 Graphology |
| | 6 Instincts |
| + 8. | 4 Innate factors in radicalism |
| + 9. | and conservatism |
| | 1 Astrology |
| — 10. | 5 The explanation which has the most |
| — 11. | universal application |
| — 12. | 4 Religion and its influences |
| + 13. | 2 Endocrinology |
| + 14. | 10 Swayed by emotions |
| — 15. | 6 Customs |
| — 16. | 7 Sensation |
| — 17. | 1 Phrenology |
| + 18. | 10 Conditioned by fear |
| + 19. | 6 Habits |
| + 20. | 6 Anger |
| — 21. | 7 Feeling, pleasant or unpleasant |
| — 22. | 6 Capacities |
| | 5 The simplest explanation |
| — 23. | 8 Observation with instrumental control |
| + 24. | 9 Accuracy |
| + 25. | 10 Subjective |
| — 26. | 8 Introspection |
| — 27. | 9 Objective |
| — 28. | 10 Rationalized |
| — 29. | 9 Impersonal attitude |
| — 30. | 2 or 8 Psychoanalysis |
| — 31. | 10 Biased by hopes |
| + 32. | 9 Precision |
| + 33. | |
| + 34. | *Second Half* |
| | 6 Titchener |
| — 35. | 0 Warren's *Human Psychology* |
| — 36. | 1 or 2 Gates *Elementary Psychology* |
| *Score* — Right minus wrong | 5 Watson |
| | 4 Strong's *Introductory Psychology for Teachers* |
| | 3 Robinson's *Mind in the Making* |
| | 1 Woodworth's *Psychology* |
| | 7 Case history method |

*Score* — Number right

TENTATIVE NORMS

| | | |
|---|---|---|
| Highest possible score | 86 | A — 61 up |
| Number cases | 231 | B — 53–60 |
| Range | 24–73 | C — 45–52 |
| Median | 49 | D — 37–44 |
| $Q_1$ (25 percentile) | 40 | E — 29–36 |
| $Q_3$ (75 percentile) | 56 | F — Below 29 |
| Average Deviation | 8 | |

## Test II — Heredity in the Development of Personality

ANSWERS

| Part I | Part II | |
|---|---|---|
| — 1. | I. 1. Metabolism 2. Reproduction 3. Inhibition 4. Irritability | ( 3 ) |
| — 2. | | |
| | Why: Not physiological process | |
| + 3. | necessary to maintain equilibrium | |
| — 4. | II. 1. Statistical 2. Experimental 3. Embryological 4. Psychological | ( 4 ) |
| + 5. | | |
| — 6. | Why: Not method of studying | |
| + 7. | heredity | |
| + 8. | III. 1. Heredity 2. Loss of job. 3. Syphilis 4. Morbid emotional development | ( 2 ) |
| + 9. | | |
| | Why: Is exciting cause; others pre- | |
| + 10. | disposing | |
| — 11. | IV. 1. Conklin 2. Thomson 3. Walters 4. Gates | ( 4 ) |
| + 12. | | |
| — 13. | Why: Made no study of heredity | |
| | V. Ontogeny 2. Phylogeny 3. Heredity 4. Creation 5. Evolution | ( 4 ) |
| + 14. | | |
| + 15. | Why: Not descriptive of organic | |
| — 16. | development | |
| | VI. 1. Dominance 2. Segregation 3. Mutation 4. Unit characters | ( 3 ) |
| — 17. | | |
| — 18. | Why: Not one of Mendel's princi- | |
| — 19. | ples | |
| | VII. 1. Native ability 2. Opportunity 3. Training 4. Environment | ( 1 ) |
| + 20. | | |
| — 21. | Why: Only hereditary factor | |

| | | |
|---|---|---|
| + 22. | VIII. 1. Pearson 2. Weissman 3. Gal- | ( 2 ) |
| + 23. | ton 4. Pearl | |
| + 24. | Why: Used embryological, not sta- | |
| — 25. | tistical method | |
| + 26. | IX. 1. Defective mentality 2. Degen- | ( 1 ) |
| | eracy 3. Criminal tendencies | |
| + 27. | Why: More influenced by heredity; | |
| — 28. | others more environmental | |
| + 29. | X. 1. Color of hair 2. Color of eyes | ( 3 ) |
| — 30. | 3. Pattern 4. Stature | |
| | Why: Only one in determination of | |
| — 31. | which sperm does not share | |
| | XI. 1. Irritability 2. Behaviorism 3. | ( 2 ) |
| — 32. | Metabolism 4. Reproduction | |
| | Why: Is not physiological process | |
| — 33. | necessary to maintain equilibrium | |
| — 34. | | |
| | *Score* — Two credits for each question: | |
| + 35. | one for correct number and one for | |
| | correct reason. | |
| + 36. | | |
| + 37. | | |
| + 38. | | |
| + 39. | | |
| — 40. | | |

*Score* — Right minus wrong

TENTATIVE NORMS

| | |
|---|---|
| Highest possible score | 62 |
| Range | 9–60 |
| Number of cases | 267 |
| Median | 39 |
| $Q_1$ (25 percentile) | 32 |
| $Q_2$ (75 percentile) | 44 |
| Average Deviation | 8 |

A — 51 up
B — 43–50
C — 35–42
D — 27–34
E — 19–26
F — Below 19

## Test III — The Behavior Mechanisms of Man

### Part I

| Number of Question | ANSWER |
|---|---|
| 1. | (3) |
| 2. | (4) |
| 3. | (1) |
| 4. | (3) |
| 5. | (2) |
| 6. | (1) |
| 7. | (1) |
| 8. | (3) |
| 9. | (2) |
| 10. | (2) |
| 11. | (1) |
| 12. | (2) |
| 13. | (3) |
| 14. | (3) |
| 15. | (2) |
| 16. | (1) |
| 17. | (2) |
| 18. | (1) |
| 19. | (3) |
| 20. | (1) |
| 21. | (1) |
| 22. | (1) |
| 23. | (3) |
| 24. | (1) |
| 25. | (2) |
| 26. | (3) |
| 27. | (1) |
| 28. | (2) |
| 29. | (3) |
| 30. | (1) |
| 31. | (3) |
| 32. | (4) |
| 33. | (2) |
| 34. | (3) |
| 35. | (4) |
| 36. | (3) |
| 37. | (3) |
| 38. | (1) |
| 39. | (2) |
| 40. | (1) |

*Score* — Number right

### Part II

| | |
|---|---|
| I. | (5) |
| II. | (2) |
| III. | (4) |
| IV. | (1) |
| V. | (3) |
| VI. | (4) |
| VII. | (2) |
| VIII. | (4) |
| IX. | (4) |
| X. | (3) |
| XI. | (3) |
| XII. | (2) |
| XIII. | (4) |
| XIV. | (1) |
| XV. | (5) |
| XVI. | (2) |
| XVII. | (3) |
| XVIII. | (4) |
| XIX. | (1) |
| XX. | (3) |

*Score* — Number right

TENTATIVE NORMS

| | | |
|---|---|---|
| Highest possible score | 60 | A — 55 up |
| Range | 26–58 | B — 50–54 |
| Number of Cases | 257 | C — 44–49 |
| Median Score | 47 | D — 39–43 |
| $Q_1$ (25 percentile) | 42 | E — 33–38 |
| $Q_3$ (75 percentile) | 52 | F — Below 33 |
| Average deviation | 6 | |

## Test IV — The Innate Equipment of Man

ANSWERS

| Part I | Part II | |
|---|---|---|
| + 1. | 1. Growth of brain; 12 years as growth of intelligence: | |
| — 2. | a. 10; b. 12; c. 14; d. 16; e. 18 | ( c ) |
| + 3. | | |
| — 4. | | |
| + 5. | 2. Infants: genetic method as animals; | |
| — 6. | a. Experimental; b. Pathologic; c. | |
| — 7. | Statistical; d. Comparative | ( d ) |
| + 8. | | |
| + 9. | | |
| — 10. | 3. Recapitulation Theory; Hall as | |
| + 11. | Utility Theory: | |
| | a. Köhler; b. Thorndike; c. | |
| — 12. | Koffka; d. Ogden | ( b ) |
| + 13. | | |
| | 4. Hall: Recapitulation Theory as | |
| + 14. | Köhler: | |
| — 15. | a. Utility; b. Recapitulation; c. | |
| | Correspondence | ( c ) |
| — 16. | | |
| — 17. | 5. Thorndike: trial and error as | |
| — 18. | Kohler: | |
| — 19. | a. Recapitulation; b. Correspond- | |
| — 20. | ence; c. Utility; d. *Gestalt* | ( d ) |
| — 21. | | |
| + 22. | 6. Adrenals: Pineal as pituitary: | |
| + 23. | a. Thymus; b. Thyroid; c. Para- | |
| — 24. | thyroid | ( a ) |

— 25.
+ 26.
— 27.
+ 28.
+ 29.
+ 30.
+ 31.
+ 32.
— 33.
+ 34.
— 35.

*Score* — Right minus wrong

Select the answers for Questions 7–11 from the following names of research students to indicate who made each of the studies listed:
a. Köhler; b. Yerkes; c. Breed and Shepard; d. Thorndike; e. Gates; f. Ogden; g. Woodworth; h. Watson.

7. Pecking of chicks ( c )
8. Study of kittens' first attempt to catch mice ( b )
9. Mentality of apes ( a )
10. Study of infants ( h )
11. First experimental study of animal intelligence ( d )

For each of the following elements indicate its proper classification as a. Native; b. Result of maturation; or c. Acquired.

12 Man's religion ( c )
13. Opposition to prohibition ( c )
14. Height of Mr. Jones ( a )
15. Washington's love for his country ( c )
16. Roosevelt's liking for outdoor life ( c )
17. Joe's liking for ice cream ( c )
18. Mr. Brown's liking for his church ( c )
19. Easy going attitude of John ( c )
20. Walking of infant ( a or b )
21. Bee finding way home ( a )
22. Musical capacity ( a )
23. Table manners of a person ( c )
24. Untrustworthiness of Mr. X ( c )
25. Edward's hatred of Japanese ( c )

*Score* — Number right

TENTATIVE NORMS

| | | |
|---|---|---|
| Highest Possible | 60 | A — 53 up |
| Range | 23–56 | B — 47–52 |
| Number of cases | 285 | C — 41–46 |

| | | |
|---|---|---|
| Median | 44 | D — 35–40 |
| $Q_1$ (25 percentile) | 39 | E — 29–34 |
| $Q_3$ (75 percentile) | 49 | F — Below 29 |
| Average Deviation | 6 | |

## Test V — Man's Emotional Life

ANSWERS

| Part I | Part II *First Half* | |
|---|---|---|
| + 1. | 8 | Rage |
| | 3 | A complex of sensation |
| + 2. | 4 | Cannon |
| — 3. | 6 | Seclusiveness |
| + 4. | 1 | James-Lange theory |
| — 5. | 6 | To blush readily |
| — 6. | 3 | A feeling "somehow" |
| + 7. | 5 | Variation of capillary pulse |
| — 8. | 0 | Emergency theory |
| — 9. | 7 | Leading in social affairs |
| + 10. | 5 | Variation of blood pressure |
| + 11. | 2 | To provide for greatest muscular strength |
| — 12. | | and endurance |
| | 5 | Coagulation of blood |
| — 13. | 0 | Watson |
| — 14. | 5 | Variation in the size of the pupil of the |
| + 15. | | eye |
| — 16. | 7 | Working steadily at the ordinary tasks of |
| + 17. | | the day |
| + 18. | 8 | Fear |
| — 19. | 7 | Making friends of persons of the opposite |
| — 20. | | sex |
| — 21. | 10 | Is more localized |
| + 22. | 7 | To keep calm during a dangerous situation |
| | 10 | The stimulus is internal |
| + 23. | 8 | Love |
| | 6 | Day-dreaming |
| + 24. | 9 | Wechsler |
| | 6 | Sudden changes in mood |
| + 25. | 9 | Smith |
| — 26. | 6 | Impulsiveness |

| Part I | Part II |
|---|---|
| — 27. | 0 Gates |
| + 28. | 6 To keep a diary |
| + 29. | 9 Marston |
| + 30. | |
| + 31. | *Second Half* |
| | 8 Ruckmick |
| + 32. | 8 Allport |
| | 5 Lust and sex excitement |
| — 33. | 3 Activity of nerve centers in adjustment |
| + 34. | 4 An organic state |
| — 35. | 3 Wanting to do something |
| *Score* — Right minus wrong | 1 Association method |
| | 2 Individual reactions |
| | 0 Warren |
| | 8 Langfeld |
| | 10 Woodworth |
| | 3 Conscious tendency |
| | 7 Depresses activity of the heart |
| | 6 Inhibits digestive secretions |
| | 6 Involved in strong emotions such as fear and anger |
| | 8 Landis |
| | 9 Brunswick |
| | 10 Pressey |
| | 10 Downey |
| | 0 Jung |
| | 0 Thorndike |
| | 0 Groves |
| | *Score* — Number right |

TENTATIVE NORMS

| | | |
|---|---|---|
| Highest possible score | 90 | A — 66 up |
| Range | 13–76 | B — 56–65 |
| Number of cases | 212 | C — 46–55 |
| Median | 50 | D — 36–45 |
| $Q_1$ (25 percentile | 42 | E — 26–35 |
| $Q_3$ (75 percentile) | 59 | F — Below 26 |
| Average Deviation | 10 | |

## Test VI — Drives or Urges in Human Behavior

ANSWERS

| Part I | Part II |
|---|---|
| — 1. | 9 Rest |
| + 2. | 4 Reproduction |
| — 3. | 9 Sleep |
| + 4. | 2 Preparatory reaction preceding definite response |
| + 5. | 5 Applicable to animals |
| + 6. | 4 Self-preservation |
| — 7. | 6 Struggling |
| — 8. | 3 Applies chiefly to specific definite acts |
| + 9. | 1 Freud |
| + 10. | 10 Decoration of the person |
| — 11. | 5 Suggests a dynamic tendency of more general character |
| — 12. | |
| + 13. | 2 James |
| | 8 Increase strength of hand grip |
| — 14. | 10 Gregariousness |
| — 15. | 6 Hunger reactions |
| + 16. | 2 Thorndike |
| + 17. | 6 Starting and withdrawing |
| + 18. | 7 Moss |
| — 19. | 3 Implies readiness to act |
| | 3 Is conscious |
| — 20. | 7 Simmons |
| | 6 Rejecting |
| — 21. | 7 Carlson |
| | 8 Flow of saliva |
| + 22. | 9 Sucking |
| — 23. | 11 Exploration |
| | 6 Sensitive zone reactions |
| — 24. | 9 Fatigue |
| — 25. | 7 Cannon |
| — 26. | 8 Dreaming |
| — 27. | 6 Sex reactions |
| + 28. | 9 Crying |
| + 29. | 11 Vocalization |
| + 30. | 10 Feeding young |
| — 31. | 11 Locomotion |
| + 32. | 11 Manipulation |
| + 33. | |
| — 34. | |
| + 35. | |

*Score* — Part I. The score is to be found by subtracting the number of wrong answers from the number of right answers. Disregard the elements which have been omitted.

Part II. The score is the number you have marked correctly.

Total Score is found by adding the scores earned in Part I and Part II.

TENTATIVE NORMS

| | | |
|---|---|---|
| Highest possible total score | 70 | A — 58 up |
| Range | 15–63 | B — 50–57 |
| Number of cases | 186 | C — 42–49 |
| Median | 45 | D — 34–41 |
| $Q_1$ (25 percentile) | 39 | E — 26–33 |
| $Q_3$ (75 percentile) | 51 | F — Below 26 |
| Average Deviation | 8 | |

## Test VII — Review Test for Topics VI and VII

ANSWERS

| Part I | Part II |
|---|---|
| 1 ( 2) | 12 Freud |
| 2 (13) | 4 Rage |
| 3 (23) | 2 Seclusiveness |
| 4 (14) | 1 Variation of blood pressure |
| | 8 Downey Will-Temperament |
| 5 (24) | 2 Excessive day-dreaming |
| 6 ( 3) | 9 Sleep |
| 7 (15 or 32) | 4 Fear |
| 8 (25) | 2 Blush readily |
| 9 ( 4) | 1 Coagulation of blood |
| 10 (16) | 8 Pressey X-O test |
| 11 ( 5) | 5 Lust and sex |
| 12 (12) | 6 Involved in mild pleasant states |
| 13 (26) | 10 Decoration of person |
| | 1 Variation size of pupil |
| 14 (27) | 4 Love |
| 15 ( 6) | 10 Gregariousness |
| 16 (17) | 3 Leader in social affairs |
| 17 (18) | 7 Secretes adrenalin |
| 18 ( 7) | 2 Impulsiveness |
| | 9 Sucking |

| Part I | Part II |
|---|---|
| 19 (29) | 3 Works steadily at ordinary tasks of day |
| 20 (18) | 9 Crying |
| 21 (12) | 13 Thorndike |
| 22 (30) | 11 Locomotion |
| 23 (19) | 3 Made friends with opposite sex |
| 24 ( 8) | 7 Involved in strong emotions, like anger and fear |
| 25 ( 1) | 11 Manipulation |
| 26 ( 2) | 13 James |
| 27 (11) | 3 Kept cool in dangerous situation |
| 28 ( 9) | 6 Depresses activity of heart |
| 29 (20) | 11 Vocalization |
| | 2 Sudden changes of mood |
| 30 (31) | 9 Feeding young |
| 31 (10) | 5 Keeping of diary |
| 32 (32) | 14 Adjustment nerve center |
| 33 (23) | 14 Wanting to do something |
| 34 (23) | 14 Conscious tendency |
| 35 (14) | 15 Organic state |
| 36 (21) | 15 Feeling somehow |

*Score* — Number right

*Score* — Number Right

TENTATIVE NORMS

| | | |
|---|---|---|
| Highest possible score | 76 | A — 59 up |
| Range | 10–61 | B — 54–58 |
| Number of cases | 81 | C — 48–53 |
| Median | 50 | D — 42–47 |
| $Q_1$ (25 percentile) | 44 | E — 36–41 |
| $Q_3$ (75 percentile) | 55 | F — Below 36 |
| Average Deviation | 6 | |

## Test VIII — Learning and Habit Formation

ANSWERS

| Part I | Part II |
|---|---|
| *First Half* | 11 Animals do not possess insight |
| 1. ( 3) | 0 Trial and error |
| 2. (10) | 10 Consider response to specific stimulus in abstraction |
| 3. ( 5) | |

## Part I

4. ( 7)
5. (12)
6. ( 3)
7. ( 6)
8. ( 3)
9. (17)
10. (11)

*Second Half*

1. 8
2. 6
3. 23
4. 9
5. 12
6. 14
7. 15
8. 21
9. 1
10. 10
11. 13
12. 22
13. 2
14. 16
15. 20
16. 19
17. 11
18. 17

*Score* — Number right

## Part II

4 Signal experiment
2 Based on reflexes
0 Maze experiment
6 Hearing
1 Studying
4 Spider and tuning fork
6 Smell
1 An organism trying to get out of hot water
4 Minnow and perch
2 Based on past experiences
6 Vision
3 All conscious
2 Special sensitiveness to certain stimuli
1 Poison injected into a mouse produced substances to neutralize poison
2 In practice least subject to alteration of our modes of behavior
11 Consider learning as a partial experience
2 All susceptible of becoming conscious
1 Rearrangement of materials when part of organism is injured
3 More susceptible to modification than instincts
6 Contact
1 A henpecked husband dreams of free love
10 Insight
0 Puzzle box experiment
10 Consider all learning as perceiving
5 Kinesthetic
7 Football fan engrossed in observing player making a touchdown
11 Consider all learning is connecting
11 Explains learning in terms of integration of reflexes
8 Less efforts spent to escape from confinement by sleepy cat
11 Explains learning in terms of S–R
9 Observation
10 Consider learning activity as a total experience

*Score* — Number Right

TENTATIVE NORMS

| | | |
|---|---|---|
| Highest possible score | 68 | A — 52 up |
| Range | 14–61 | B — 46–51 |
| Number of cases | 188 | C — 40–45 |
| Median | 42 | D — 34–39 |
| $Q_1$ (25 percentile) | 37 | E — 28–33 |
| $Q_3$ (75 percentile) | 48 | F — Below 28 |
| Average Deviation | 6 | |

## Test IX — Economical Methods of Acquiring Skills and Knowledge

ANSWERS

| Part I | Part II |
|---|---|
| 1 ( 1) | 11 Unspaced distribution of practice |
| 2 ( 9) | 4 Makes for more successful reproduction |
| 3 ( 1) | 11 Learn by parts |
| 4 (19) | 7 Memorizing |
| 5 (28) | 2 Use of phonetics |
| 6 (10) | 9 Sense organ adjustment |
| 7 (19) | 1 Instinctive and exploratory |
| 8 ( 2) | 0 Recall |
| 9 (18) | 2 Teaching syllables |
| 10 (20) | 10 Recitation |
| 11 (11) | 5 Makes for greater improvement of ability to reason with material |
| 12 (26) | 8 Retention |
| 13 ( 3) | 3 Counting on fingers |
| 14 ( 3) | 6 Recognition |
| 15 ( 4) | 11 Use crutches |
| 16 (21) | 1 Forced |
| 17 (29) | 10 Learn by wholes |
| 18 ( 4) | 3 Carrying numbers |
| 19 (27 or 3) | 10 Spaced distribution of practice |
| 20 ( 5) | 5 Make for larger increase in spread of information |
| 21 (13) | |
| 22 (30) | 9 General attitude |
| 23 (14) | 1 Objective interest |
| 24 (23) | 11 Very long practice |
| 25 (31) | 10 Make material meaningful |

**Part I**

26 ( 7)
27 (15)
28 (24)
29 ( 8)

*Score* — Number right

**Part II**

11 Very short intervals
11 Use of avenue of presentation, models, etc. on basis of type of imagery determined
14 Anxiety
0 Woodworth
11 Use perfect copybook samples as models
12 Gates
14 Distractions
1 Opposition to attempts to increase spread of reading on grounds that makes for decrease in accuracy
13 Seashore
10 Use actual work which is within range of child's possible achievement as model
0 Robinson
14 Emotional excitement

*Score* — Number right

TENTATIVE NORMS

| | | |
|---|---|---|
| Highest possible score | 65 | A — 55 up |
| Range | 25–60 | B — 49–54 |
| Number of cases | 91 | C — 43–48 |
| Median | 45 | D — 37–42 |
| $Q_1$ (25 percentile) | 39 | E — 31–36 |
| $Q_3$ (75 percentile) | 50 | F — Below 31 |
| Average Deviation | 6 | |

## Test X — How We Perceive

ANSWERS

**Part I**

1. (b)
2. (b)
3. (b)
4. (a)
5. (c)
6. (c)
7. (b)

**Part II**

*First Half*

1 Seeing it is a wet day
5 Rapid recognition of material
6 Double image phenomenon
2 A sensory process
6 After images
4 Difficulty of reading material calling for analysis

| Part I | Part II |
|---|---|
| 8. (b) | 7 Burglar-hearing |
| 9. (b) | 1 A sensory-cerebro process |
| 10. (c) | 5 Rhythmical eye movements |
| 11. (b) | 1 Inceptive interpretation |
| 12. (b) | 7 Mistaking cat yowls for crying of a baby |
| 13. (e) | 3 Beginning of the process of discovering facts |
| 14. (d) | 9 Proofreaders' illusions |
| 15. (h) | 2 Hearing the sound of a street car |
| 16. (l) | 8 Aristotelian illusion |
| 17. (g) | 1 Culmination of the process of discovery |
| 18. (k) | 5 Wider perception unit |
| or (m) | 2 First conscious response to a stimulus |
| 19. (c) | 8 Movies |
| 20. (d) | 2 Takes place only when the stimulus is present |
| 21. (e) | 1 Second conscious response to a stimulus |
| 22. (c) | 7 Smelling the odor of beautiful roses in a closed |
| 23. (c) | florist's shop |
| 24. (b) | 9 Müller-Lyer illusion |
| | 3 Selection of stimuli to be perceived |
| *Score* — Number Right | 9 Poggendorf's illusion |
| | *Second Half* |
| | 5 Shape of retinal image |
| | 5 Perspective or depth arrangement |
| | 5 Environment or surrounding objects |
| | 4 Lemonade |
| | 3 Bright colors |
| | 1 Personification of inanimate objects |
| | 4 Like or dislike of olives |
| | 1 Colored hearing |
| | 3 Fragrant odors |
| | 2 One-eyed persons do not suffer from illusions to solidarity of objects around them |
| | 4 Like or dislike of cheeses |
| | 1 Visualization of numbers and letters in some fixed scheme and projected into space |
| | 4 Subdued colors |
| | *Score* — Number right |

TENTATIVE NORMS

| | | |
|---|---|---|
| Highest possible score | 62 | A — 49 up |
| Range | 21–53 | B — 43–48 |
| Number of cases | 85 | C — 37–42 |
| Median | 39 | D — 31–36 |
| $Q_1$ (25 percentile) | 35 | E — 25–30 |
| $Q_3$ (75 percentile) | 43 | F — Below 25 |
| Average Deviation | 5 | |

## Test XI — How We Think

ANSWERS

**Part I**

1. (a)
2. (d)
3. (c)
4. (d)
5. (a)
6. (b)
7. (b)
8. (d)
9. (d)
10. (a)
11. (d)
12. (a)
13. (b)
14. (c)
15. (c)
16. (a)

*Score* — Number Right

**Part II**

5 A good stock of knowledge
6 Our desires
11 Is cue to adjustment
1 Imagination
7 Suggestion of solution
4 A person deaf from birth cannot imagine sounds
3 Belief of rural people that large cities are wicked
5 Be a good guesser
1 Reasoning
6 High sounding statements
2 A chemist analyzing an unknown
10 Talking to ourselves
6 Preconceptions
7 Felt difficulty
1 Day-dreams
11 Is formulated experience
4 A person blind from birth cannot imagine colors and shades
7 Definition and location
2 A doctor making a thorough diagnosis
8 From particulars to universal
1 Night-dreams
7 Verification
6 Anthropomorphism
5 A critical attitude

| Part I | Part II |
|---|---|
| | 1 Memory |
| | 3 Militarist proving that war is necessary and beneficial |
| | 6 Customary authority |
| | 1 Rationalization |
| | 7 Conclusion |
| | 3 Socialists arguing that all opponents are in league with capitalists |
| | 11 Detached meaning provided with a name |
| | 8 Used in natural sciences |
| | 8 Type of thinking in which insufficient number of cases is most frequent fallacy |
| | 11 Is formulating experience |
| | 10 Can think without words |
| | 9 Used in study of geometry |
| | 8 or 2 Kind of thinking which begets knowledge |
| | 11 Tools of thinking |
| | 10 Implicity language habit |
| | 9 From universal to particular |
| | 11 Makes conduct more adaptable |
| | 10 Subvocal talking |
| | 11 A system of ideas or intellectual habits |

*Score* — Number right

TENTATIVE NORMS

| | | |
|---|---|---|
| Highest possible score | 59 | A — 52 up |
| Range | 28–56 | B — 47–52 |
| Number of cases | 129 | C — 41–46 |
| $Q_1$ (25 percentile) | 39 | D — 35–40 |
| $Q_3$ (75 percentile) | 47 | E — 29–34 |
| Median | 43 | F — Below 29 |
| Average Deviation | 6 | |

## Test XII — The Abilities of Man — Their Nature and Measurement

ANSWERS

### Part I

1. ( 7)
2. ( 8)
3. ( 1)
4. ( 2)
5. ( 9)
6. ( 3)
7. (10)
8. ( 4)
9. (11)
10. (12)
11. (17)
12. (14)
13. (18)
14. (13)
15. (19)
16. (20)
17. (14)
18. (14)
19. (19)
20. (15)
21. ( 5)
22. ( 6)

*Score* — Number right

### Part II

16 Invention
1 Retentiveness
6 Stenquist
2 Uni-modal
5 Downey Will-Temperament
7 Seashore
0 M.A. of 7
5 Voelker tests
8 Mode
1 Persistence
8 Mis-score
3 Multi-modal
8 Median
5 Pressey X-O
1 Responsiveness
9 Average deviation
4 Non-modal
8 Arithmetic mean
11 M.A. up to 2
9 Standard Deviation
10 Foot-Rule
10 R
11 20 I.Q.
12 M.A. 3, C.A. 7
17 M.A. 6, C.A. 9
14 100 I.Q.
11 15–20 I.Q.
13 70 I.Q.
16 Direction
15 I.Q. 140 up
16 Censorship
9 Q
16 Comprehension

*Score* — Number right

TENTATIVE NORMS

| | | |
|---|---|---|
| Highest possible score | 55 | A — 48 up |
| Range | 21–50 | B — 42–47 |
| Number of cases | 55 | C — 36–41 |
| Median | 38 | D — 30–35 |
| $Q_1$ (25 percentile) | 32 | E — 24–29 |
| $Q_3$ (75 percentile) | 43 | F — Below 24 |
| Average deviation | 6 | |

## Test XIII — Personality

ANSWERS

| Part I | Part II |
|---|---|
| 1. (d) | 2 Watson |
| 2. (c) | 5 Social taboo |
| 3. (a) | 1 Freud |
| 4. (b) | 11 Dementia praecox |
| 5. (b) | 4 Inability to rise to level of family aspirations |
| 6. (b) | 8 Slips of speech |
| 7. (b) | 5 Antagonistic urge |
| 8. (a) | 7 Excusing careless behavior by calling it |
| 9. (h) | "Lord's Will" |
| 10. (g) | 10 Sullenness |
| 11. (j) | 1 Jung |
| 12. (d) | 5 Antagonistic habit system |
| 13. (7) | 11 Psychasthenia |
| 14. (1) | 8 Dreams |
| 15. (4) | 3 Berman |
| 16. (10) | 4 Too easy early success giving false security |
| 17. (2) } | 6 Consider loss of job as blessing in disguise |
| 18. (8) } | 1 Adler |
| 19. (5) | 7 Calling examination failed on unfair |
| 20. (11) | 5 Obstacles in environment |
| 21. (3) | |
| 22. (6) | 1 Psychoanalysts |
| 23. (12) | 6 Calling pretty people stupid when you don't |
| 24. (9) | know their intelligence |
| | 10 Child's refusals to eat |
| *Score* — Number right | 1 Janet |
| | 11 Shell shock cases |

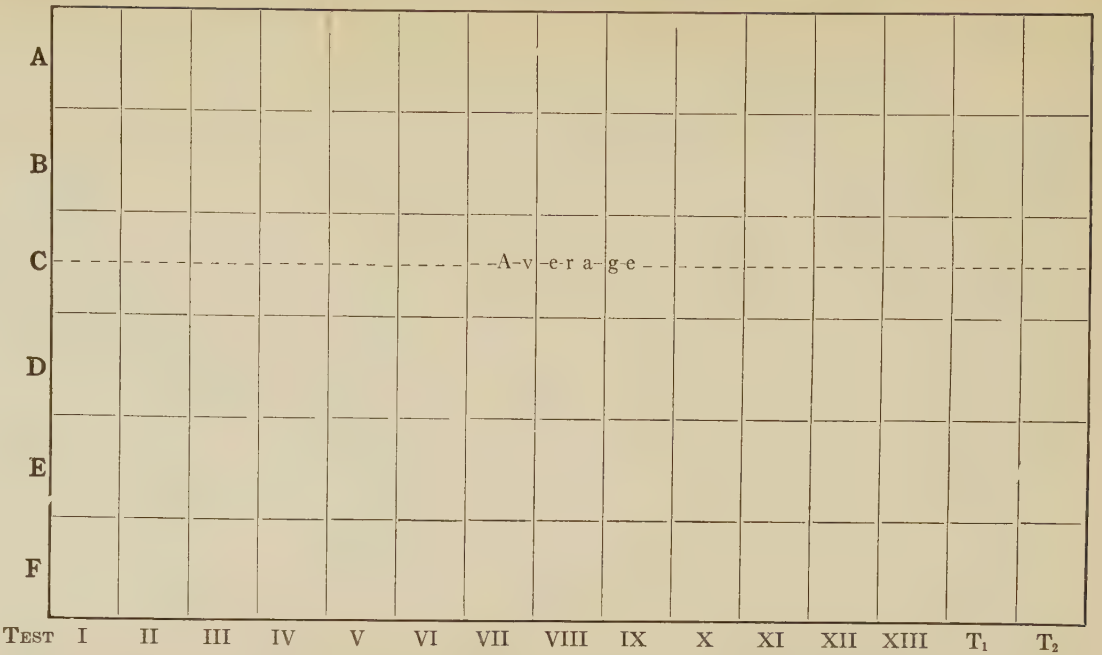
| Part I | Part II |
|---|---|
| 4 | Undue intense drive toward unattainable goal |
| 8 | Wit and humor and its reception |
| 2 | Behaviorists |
| 7 | Drunkard blaming alcoholism on heredity |
| 1 | Prince |
| 4 | Unfavorable comparison |
| 0 | Dissociation |
| 9 | Does not distinguish between self and other selves |
| 10 | Child's refusal to play |
| 0 | Franz |
| 11 | Mental conflict |
| 10 | Pretended injuries of child |
| 11 | Hysteria |
| 11 | Manic depressive form of insanity |

*Score* — Number right

TENTATIVE NORMS

| | | |
|---|---|---|
| Highest possible score | 62 | A — 54 up |
| Range | 27–56 | B — 50–53 |
| Number of cases | 135 | C — 46–49 |
| Median | 48 | D — 42–45 |
| $Q_1$ (25 percentile) | 44 | E — 38–41 |
| $Q_3$ (75 percentile) | 50 | F — Below 38 |
| Average deviation | 4 | |

## CHART FOR TEST GRADES




On the above chart, or one like it, plot your grades. In the respective columns, one of which is provided for each test, indicate your test scores by a conspicuous dot or line opposite the grades earned. Watch your record!

The following table presents in a summarized form for
have earned in the

## SUMMARY OF NORMS

HISTORICAL DATA

| *Test No.* | *Med.* | $Q_1$ | $Q_3$ | *AD* | *Range* | *No. of cases* |
|---|---|---|---|---|---|---|
| 1 | 49 | 40 | 56 | 8 | 24–73 | 231 |
| 2 | 39 | 32 | 44 | 8 | 9–60 | 267 |
| 3 | 47 | 42 | 52 | 6 | 26–58 | 257 |
| 4 | 44 | 39 | 49 | 6 | 23–56 | 285 |
| 5 | 50 | 42 | 59 | 10 | 13–76 | 212 |
| 6 | 45 | 39 | 51 | 8 | 15–63 | 186 |
| 7 | 50 | 44 | 55 | 6 | 10–61 | 81 |
| 8 | 42 | 37 | 48 | 6 | 14–61 | 188 |
| 9 | 45 | 39 | 50 | 6 | 25–60 | 91 |
| 10 | 39 | 35 | 43 | 5 | 21–53 | 85 |
| 11 | 43 | 39 | 47 | 6 | 28–56 | 129 |
| 12 | 38 | 32 | 43 | 6 | 21–50 | 55 |
| 13 | 48 | 44 | 50 | 4 | 27–56 | 135 |
| T(1) | [1] 262 | 243 | 294 | 26 | 183–363 | 211 |
| T(2) | [2] 225 | 210 | 249 | 24 | 102–304 | 140 |

[1] Norms for first six tests covering materials of first three sections.

TO READ: For test 1 the median is 49; $Q_1$ 40; $Q_3$ is 56; the
is from 24 to 73; and the number of cases upon which these values
grade of A; from 53 to 60, a grade of B; and so on.

ready reference the norms for interpreting scores which you previous thirteen tests.

FOR TESTS

GRADE EQUIVALENTS

| *A* | *B* | *C* | *D* | *E* | *F* |
|---|---|---|---|---|---|
| 61 up | 53–60 | 45–52 | 37–44 | 29–36 | below 29 |
| 51 up | 43–50 | 35–42 | 27–34 | 19–26 | below 19 |
| 55 up | 50–54 | 44–49 | 39–43 | 33–38 | below 33 |
| 53 up | 47–52 | 41–46 | 35–40 | 29–34 | below 29 |
| 66 up | 56–65 | 46–55 | 36–45 | 26–35 | below 26 |
| 58 up | 50–57 | 42–49 | 34–41 | 26–33 | below 26 |
| 59 up | 54–58 | 48–53 | 42–47 | 36–41 | below 36 |
| 52 up | 46–51 | 40–45 | 34–39 | 28–33 | below 28 |
| 55 up | 49–54 | 43–48 | 37–42 | 31–36 | below 31 |
| 49 up | 43–48 | 37–42 | 31–36 | 25–30 | below 25 |
| 52 up | 47–52 | 41–46 | 35–40 | 29–34 | below 29 |
| 48 up | 42–47 | 36–41 | 30–35 | 24–29 | below 24 |
| 54 up | 50–53 | 46–49 | 42–45 | 38–41 | below 38 |
| 302 up | 276–301 | 249–275 | 223–248 | 197–222 | below 197 |
| 263 up | 239–262 | 215–238 | 190–214 | 166–189 | below 166 |

[2] Norms for last six tests covering materials of last three sections.

average deviation from the median is 8; the range of actual scores have been determined is 231. Scores of 61 and above receive a

# BIBLIOGRAPHY

There is presented here a list of the books with their titles, names of their respective publishers, and authors that are recommended and should be made available for students' use in an introductory course in psychology. The list is not forbiddingly long, although a first glance may give such an impression. On the contrary, the use of the books as suggested here makes possible a selection which can secure the advantages of both extensive and intensive learning. To the problem of practicality of the method presented there are three answers. First, most of the books to which reference is made are already available as standard books in reasonably equipped libraries. For those libraries which are not so equipped the authors recommend supplementation, as rapidly as possible, of their present books until sufficient books, properly selected to be really valuable and useful, will be available. Such is the function of a library. The first tool of intellectual life in a college is its available literature; insistence upon an adequate supply of books needs no defence. Secondly, for those colleges in which their libraries cannot immediately meet the desired requirements of *Developed Lessons* there is the advantage in the numerous references in that from their number at least one or more may be available, and to that extent the course can be enriched. Opportunity is afforded also for special emphasis upon particular problems, points of view, or method of study as may be desired in local situations.

The purchase of books by members of classes, especially large ones, in those colleges in which required or necessary books are not properly available in their respective libraries is a custom which is spreading rapidly in popularity. According to this plan supplementary books are ordered as required and a tax to pay for them is levied, by class vote, upon the members of the class. During the term these books are kept on the reserve shelf and thus are available to all members of the class. At the end of the term or semester the books are allotted to the students either in order of preference or by chance drawing. This method permits the student to have access to several or many books throughout his course for the cost of perhaps a single one, and at the end of the term he receives books for the value of his money.

The third answer to the problem of practicality is the practical argument that *Developed Lessons* is the outgrowth of classroom procedure and has been tried, references and all, in representative colleges with success!

It should be noted that the Bibliography falls naturally into two large divisions. Division One includes references in the general field of psychology under the three headings: A Texts; B, Supplementary Reading; and C, Special References. Division Two lists references upon special topics of psychology for more intensive or extensive study by superior or honors students or sections.

## Division One

### A. Texts

The material which is fundamental for the study of *Developed Lessons* can in large measure be obtained from any one of the following texts. In most cases from seventy-five to ninety per cent of the questions can be answered from the material found in any one. Each student should have, then, in his own possession and for major study, a copy of at least one of these. Should the discussion method be used, some students should use the first named, others the second, others the third, and still others the fourth. In this way the essentially different materials and viewpoints of the four texts will be made available to all members of the class. In classes of more capable students arrangements can be made whereby individuals may occasionally exchange texts in order to study more carefully the topic as found in two or more of the texts.

1. Woodworth, R. S. — *Psychology* (Revised), Holt, 1929,[1] or *Psychology: A Study of Mental Life;* Holt, 1921
2. Gates, A. I., — *Elementary Psychology* (Revised), Macmillan, 1928,[1] or *Elementary Psychology,* Macmillan, 1927
3. Robinson and Robinson — *Readings in General Psychology,* University of Chicago Press, 1926
4. Perrin and Klein — *Psychology: Its Methods and Principles,* Holt, 1926

[1] In most instances references are given to both editions. The first reference given refers to the revised edition; references to the earlier editions usually follow those to the revised edition and are enclosed within parentheses.

### B. GENERAL REFERENCES

The following books will be useful for general supplementary reading and references to them have been made in the *Developed Lessons*. They are listed here in order of frequency of their use. Copies of each, so far as is practicable, should be available on the reserve shelf in the library.


1. DASHIELL, J. F. — *Fundamentals of Objective Psychology*, Houghton, Mifflin, 1928
2. WATSON, H. B. — *Behaviorism*, Norton, 1925
3. MARTIN, E. D. — *Psychology: What It Has To Teach You About Yourself and the World*, Norton, 1924
4. OGDEN, C. K. — *The Meaning of Psychology*, Harper's, 1926
5. CARR, H. A. — *Psychology: A Study of Mental Activity*, Longmans, Green, 1925
6. WARREN, H. C. — *Elements of Human Psychology*, Houghton, Mifflin, 1922
7. BURNHAM, W. A. — *The Normal Mind*, Appleton, 1924


### C. SPECIAL REFERENCES

Practically all of the following list of books are referred to but once in the *Developed Lessons*. This means that it will be necessary for the library to have these books on reserve only for the short period of time during which the special topic is considered. Some of the books on the list, like Conklin's *Heredity and Environment*, are found on the reserve list of other departments. The library burden is, therefore, smaller than is indicated by the size of the list.


1. ADDAMS, HEALY, WOOLEY, and others — "The Child, the Clinic, and the Court," *New Republic*, 1925
2. ALLPORT, F. H. — *Social Psychology*, Houghton, Mifflin, 1924
3. BOAS, F. — *The Mind of Primitive Man*, Macmillan, 1911
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## Division Two

### References for Further Study (Honor Students or Sections)

The following references are not required in the regular use of *Developed Lessons.* All the questions asked can be answered without their use. They are intended as a guide for those students whose interest has been aroused by one or more of the topics studied and who want a more comprehensive treatment, more intensive or more extensive as the case may be, of such topics. To serve this purpose the references are listed under the captions of sections and topics used in the *Developed Lessons.* The use of these has been found to be helpful in an honors section directed by one of the writers.

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